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TEACHERS COLLEGE RECORD

A Journal Devoted to the Practical Problems of Elementary and Secondary Education and the Professional Training of Teachers

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HORACE MANN SCHOOL

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Edited by JAMES E. RUSSELL

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ANNOUNCEMENT OF VOLUME III — 1902

No. 1 January	Papers by Dr. D. C. GILMAN, Ex-President of Johns Hopkins University, Professor S. T. DUTTON and others on *Present Day Problems in Education.*
No. 2 March	*Physics and Chemistry in The Horace Mann Schools.* Professor J. F. WOODHULL.
No. 3 May	*The Teaching of Cæsar in Secondary Schools.* — — Professor GONZALEZ LODGE.
Nos. 4 and 5 September and November	*The Record of a Year's Work in the Primary Grades of the Teachers College Schools.*

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TEACHERS COLLEGE RECORD

VOL. III JANUARY, 1902 NO. 1

THE HORACE MANN SCHOOL

The history of the Horace Mann School is interwoven with the history of Teachers College. During its early years the chief work of the College was the encouragement of industrial education, particularly for children who were attending the public schools of New York City. When the College definitely proposed to itself in the fall of 1887 the work of training teachers a school of observation and practice became at once a necessity. A school was needed in which the College professors of education might experiment in curricula and methods of teaching, as professors of science experiment in a laboratory. It was important, too, to have a school in which to illustrate approved educational principles and to demonstrate the worth of certain new theories in the training of children. In its advocacy of manual training, domestic economy and the natural sciences as worthy of rank with the traditional subjects of school curricula, the School was in advance of its times. Parents and pupils were quick to see the advantages it offered and its growth was rapid almost from the start.

The first year 64 pupils were enrolled in the kindergarten and elementary grades. The High School was established in 1889 with nine pupils. In 1890 the number of pupils enrolled in all departments was 253. Thereafter the numbers in successive years were 211, 264, 280, 327, 486, 398, 395, 534, 567, and finally in 1900-1901, 639. The annual fee for tuition in 1888 was $4, including books, and in 1889, $10. Two years later

Horace Mann School.

the fees were increased to $25 in the lowest grades and to $150 in the High School. In 1896 the schedule was advanced to $60 in the kindergarten, $125 in the primary grades, $150 in the grammar grades and $200 in the High School.

These figures really disclose a good deal of the internal history of the School. They show the small beginnings, the marked popularity of the institution and its rapid growth. It has been the policy of the management from the beginning to make the Horace Mann School the best possible kind of school. No expense has been spared when funds could be secured for its benefit. Departments have been introduced when it was perfectly obvious that they could not be self-supporting. In fact the School as a whole has never been able at any time and probably never will be able to pay for what it receives. The interests of the College will not permit of niggardly management and the patrons of the School will be satisfied with nothing short of the best.

In some respects the relations between the School and the College have changed in recent years. One object of the School originally was to afford practice in teaching to inexperienced students of the College. The recent growth of the College, however, has made it possible to exclude immature students and consequently to lessen the demand for mere training in teaching. On the other hand the presence in the College of students who are experienced teachers and engaged in investigation and research in all fields of education makes it imperative to have a school exclusively devoted to experimentation. Such a school was established by the College in 1899 and has since been conducted in Lawrence Street. Last spring Mr. and Mrs. James Speyer generously provided for a suitable building and equipment, and in recognition of their gift the school will henceforth be known as the Speyer School. This School and the Horace Mann School are supplementary to each other. The former is intended to test and work out new ideas in education; the latter has for its function the demonstration of all that is best in teaching and school management under conditions that are as nearly ideal as can be provided.

The material development of the Horace Mann School is not the least significant feature of its history. During the first five years of its existence the School occupied a few ill-adapted

Entrance Hall.

rooms in 9 University Place. In 1894, when the College was moved to Morningside Heights, the School was given the second floor of the main building for class rooms and was allowed to share the library, shops and laboratories with the College students. But the demands of both grades of students could hardly be satisfied with the same equipment. In order to facilitate the growth of the College and to give the School free scope for its own development, Mr. and Mrs. V. Everit Macy have generously provided a new school building at a cost, including grounds and equipment, of approximately $550,000. This building was dedicated on December 5, 1901, as a memorial of Mrs. Caroline L. Macy, herself a devoted friend and benefactor of Teachers College. In her memory this number of the RECORD is offered to the public for encouragement in philanthropy and for the promotion of true education.

J. E. R.

Dedication of the Horace Mann School

DECEMBER 5th, 1901

Mr. SPENCER TRASK, Chairman of the Board of Trustees of Teachers College, presiding

1. Music.

2. Remarks by MR. JOHN GRAHAM BROOKS.

3. Exercises of Consecration led by Rt. Rev. HENRY C. POTTER.

4. Hymn. — "Holy, Holy, Holy."

5. Address by DANIEL C. GILMAN, LL.D.

6. Remarks by Dr. NICHOLAS MURRAY BUTLER, Acting President of Columbia University.

ADDRESS BY MR. TRASK

President of the Board of Trustees of Teachers College

The Trustees of Teachers College about ten years ago decided that what had been hitherto accomplished warranted the expectation of still greater work. They felt it was time to put aside the day of small things, and with large Hope and Faith, but with a lean bank account, they determined to move and build upon larger foundations.

The manual training feature of the work in University Place had enlisted the enthusiastic interest of a number of young men whose circumstance of birth might naturally have led them to indulge in far different and more selfish pursuits. Some of these young men were members of our Board of Trustees.

It was to one of these, Mr. George Vanderbilt, to whom we were indebted for the first gift of land, which made our determination to enlarge our borders first possible.

It was the influence of another young Trustee, Mr. V. Everit Macy, that led his mother, Mrs. Josiah Macy, to offer to erect the Manual Training building, which enabled us to begin our new buildings on a much more extended scale than we had at first thought possible.

Since then, what has been accomplished speaks for itself in solid stone. To-day we see almost the entire block covered with buildings directly connected with the work of the College.

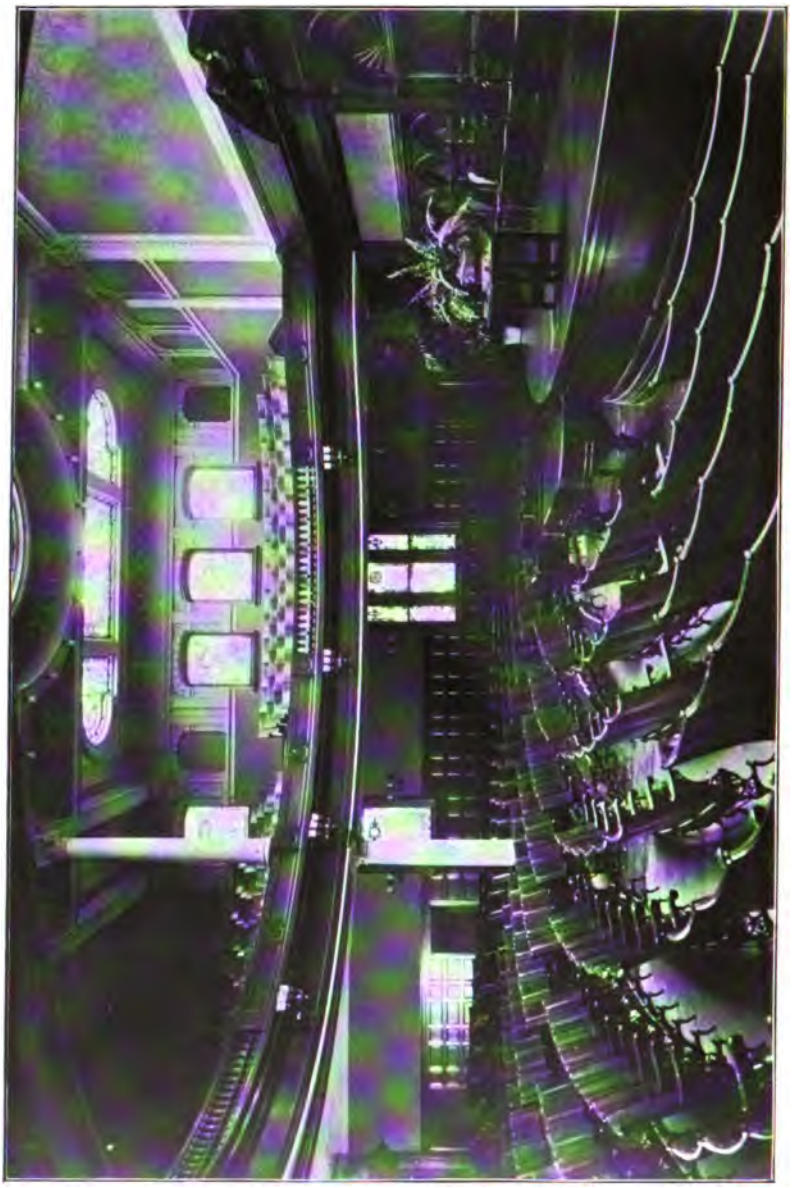
It is not the time nor place for me now to enlarge further upon the great progress that has been made in all other directions, nor to eulogize the various donors, who, as occasion arose, and needs were manifest, from time to time gave freely and generously. It is of this last gift we would speak to-day.

This noble building is a splendid and confirming proof of Mr. Macy's intelligent interest and generous giving. Mr. and Mrs. Macy present this building as a Memorial to his mother, to whom we are already indebted for so much; above all things are we indebted to her for the gift of her son, nurtured and educated by her moulding hand, to be a worthy successor to the father in whose memory the Manual Arts building was erected.

These two — mother and father — united in life, are now

Reception Room.

Superintendents Offices.



The Auditorium.

forever associated together, in the far-reaching work of educating the youth and preparing them for a life useful to themselves and the community.

As a College for the training of teachers, it is especially worthy of note that three of our present buildings are memorials to parents, the first of all teachers, — the ones who sow the seed that afterwards make the character of the man and woman.

And when we to-day express our thanks and appreciation for this and other lavish gifts that have made a phenomenal record for our College, we add our meed of gratitude and honor to those in whose memories the gifts have been made, and through whose training and example the donors have been educated to make them.

ADDRESS BY DANIEL C. GILMAN, LL.D.

HORACE MANN, THE EDUCATIONAL REFORMER[1]

The name of this school suggests my theme. I shall take it as a starting point though I may not return to it. Nor shall I be tethered. Once mounted upon that wayward steed whose name is "Opportunity," you may expect me to course over a wide field, picking here a grain of wheat, there a poppy, now an apple or an acorn from some o'ertopping tree.

However far I may wander, let me begin at home, in this city, in this university, in this college, in this school. First, I congratulate all who are here assembled upon the evidences of municipal progress that are shown by the Borough of Manhattan. The triumph of reform in the recent election has given courage to patriots in every part of the land, and the selection for the mayoralty of a leader in education, the head of this metropolitan university, the supreme authority in our Teachers College, invigorates and inspires the rank and file in schools of every grade; while his acceptance of the perplexities, cares, and criticisms of the arduous post to which he is called is an instance of unselfish devotion to the public service, which may be an example to every student, to every citizen. He has been so

[1] Dr. Gilman's address was only partly written. This report is from his notes.

fortunate as to see the historic college of New York transformed into a University and translated to these transcendent heights, surrounded by other institutions of education, philanthropy, and religion, not far from the museums of art and science and within sight of the monument to the great soldier who defended the union in its days of peril.

In all this group, the Teachers College has rank of high degree, distinguished for many reasons,—among them, that it is unique. There are normal schools elsewhere,—as there are colleges, model schools, kindergartens, manual training institutions, but so far as I know the Teachers College of Columbia University is without a parallel. There is nothing exactly like it. Hence the interest which is felt at a distance in each surprising step of its advancement. Join me in thanks for the ideas that are here embodied, and for the rare intelligence which initiated this extraordinary enterprise and developed its plans so steadily, so wisely and so brilliantly that money, friends and opportunities have increased in both the decades of its history. Look back to the humble beginnings in University Place; recall the pride which we felt on the acquisition of this new site; then look around upon the activities that are manifest in this extraordinary group of schools, libraries, working rooms, collections. Remember also that the distinctive idea is to show that there are arts and methods in teaching that may be acquired by the observing and diligent, that these arts and methods are not routine, that they vary with the growth of knowledge, and advance with the progress of modern civilization.

To-day we are rejoicing in this model school house. Two generous persons, with munificence characteristic of enlightened wealth in our day, have furnished the means by which this edifice becomes a silent teacher, showing to all who enter its doors as students or visitors an arrangement of rooms, furniture and corridors with methods of lighting, warming, and ventilation of the most approved pattern and with excellent apparatus—modern, appropriate, and serviceable, not copyrighted nor patented but open to adoption on a smaller scale in any part of the country. The very walls are vocal,—though teachers and scholars may be off on a holiday. Recently we have heard that halls of residence are also opened. After twenty years of effort, the directors of this Teachers College rejoice in the owner-

View toward the Hudson.

View toward Columbia University.

ship of a noble group of buildings, in close affiliation with a great university, in near relations with a college for women, with throngs of students of every grade, from the children just out of the nursery to the grave and reverend seniors, "children of a larger growth," and with a faculty young, vigorous and inspiring. An English traveler comments upon "the atmosphere of life and enthusiasm," which she breathed when she came to the Teachers College. She was right. Her respiration was normal. Here *is* an air of youth and vigor, — but that is not all.

I am impressed by other merits,—the intelligence, the learning, the skill, and the productivity of the staff. Nothing is too old or too distant to secure their attention. The Dean masters the school systems of Germany. He learns many lessons, although he tells us openly that he has a difficult task. These are his words: "No one of my readers, I am sure, can be more dissatisfied than I am myself with this attempt to portray German ideals and German methods. The subject is too important to be lightly treated and too extensive to be understood on short acquaintance. I trust, however, that my work may lighten the labors of other students in this field and prove to be of some practical worth to educators." Nevertheless he continues, "Sermonizing on the basis of foreign customs is always of doubtful expediency. It is, indeed, questionable whether there is anything peculiar to the German theory and practice of teaching which is directly applicable to British or American conditions. *Each nation must educate itself in its own way and for its own ends.* The chief value of foreign examples consists in a rational understanding of the foreign way of adapting means to ends in the realization of great ideals." He makes this presentation so that we Americans may appreciate the successful methods elsewhere employed "of adapting means to ends in the realization of great ideals." Herein lies wisdom.

Another member of the faculty brings together, with wise introductions, copious extracts from the ancient classical writers so that Plato and Aristotle, Plutarch and Suetonius and Quintilian may be living teachers and we may gather the grains of wheat which they have left us.

Another member of the staff reviews with bibliographical skill the literature of American education, that nothing among the fragments may be lost, and commemorates in one page

The Gymnasium.

The Lunch Room.

Comenius, in another, Barnard. Still another one discusses, in lectures that are printed, the social phases of Education in the School and Home.

Here are several chapters of experience — Classical, European, American, recently presented to the public at large by members of the faculty.

This Teachers College is far more than a local foundation. It is resorted to by many school officers from a distance. Quite recently in a southern city it became important to establish a training place for the teachers of that large community. The first thing was to send those who were to be in charge of the school to the Teachers College for suggestion and guidance. At the present moment in another southern city there is a great normal institute fashioned upon the older models and the managers of it are considering whether it is not possible to recast its work and its courses of instruction upon the models here set forth. Not long ago a party of southern gentlemen, eager to awaken their compatriots to a love of public schools, came here for inspiration.

The great personage after whom this school is named was the most conspicuous leader of public education in this country between 1830 and 1850. That is a long while ago, so long that it is doubtful whether any one among us ever heard his voice. If he is not a shade to us like Ascham, Comenius, and Locke, he is a statue in bronze standing before the State House of Massachusetts, by the side of Daniel Webster, cold, solemn and distant. I hope he is not confounded with another Horace Mann, a famous Englishman of the eighteenth century, whose correspondence with Sir Robert Walpole, carried on for forty-four years, humorously said to be "without a parallel in the history of the Post Office." Our Horace Mann was an educational reformer. Now, "educational reformers," says Mr. Quick, "are the men above all others who stimulate us to think about education." So if on this auspicious day we wish to "think about education," we must forsake the abstract and dwell upon the concrete, — the great statesman, orator, agitator, reformer, inspirer, who initiated the restoration of the common schools in New England, brought the system to a high degree of perfection, and to a reluctant and skeptical community introduced normal schools for the training of teachers.

The materials for such a study are not wanting. His Memoir was written by his wife, and his principal writings, having been re-published during his life-time, now stand upon our

The Kindergarten Room.

shelves in four stately volumes; I say "stand" upon our shelves, they are not often consulted, for the contents do not attract the readers to-day. They belong to that class of papers which are

Elementary Hand Work Room.

designated "Remarks Appropriate to the Occasion," producing strong impressions—so timely in fact that to another generation they are not timely. There is a recent and very readable

biography by Dr. B. A. Hinsdale, of Michigan, which I commend to general perusal, and if further information is desired, the son of the great reformer has provided for our guidance a list of more than seven hundred titles, including those of his father's writings, and of the comments on his life and works.

Nor do I forget that a candidate for the degree of Doctor of Philosophy in this Teachers College chose for his graduation dissertation the work of Horace Mann in Ohio, as President of Antioch College. Perhaps a future candidate may discover in the more noteworthy services of Horace Mann in Massachusetts, the subject for another dissertation and it will be fortunate if he works as well as Dr. Hubbell.

Near the beginning of the nineteenth century, Massachusetts, the prolific mother of reformers, gave birth to a score of men, who became in their early maturity, advocates and defenders of public education. James G. Carter, father of normal schools, Charles Brooks, George B. Emerson, Edmund Dwight, Cyrus Pierce were of this number, and although, among them all, Horace Mann is best known, a close second is Dr. Samuel G. Howe, the illuminator of Laura Bridgman and Helen Keller. Yet Massachusetts is not the only mother of great leaders in education. In New York, De Witt Clinton, almost thirty years older than Mann, gave an impulse to public instruction long before the awakening in Massachusetts. Bishop Alonzo Potter, the father of our Bishop Potter, became an earnest coöperator in the work, and at a later day, S. S. Randall. Connecticut had her leaders in Denison Olmsted, Thomas H. Gallaudet, and Henry Barnard. Rhode Island caught the fire when Barnard, and Elisha R. Potter aroused the community to the importance of education. As the Western States were developed, the light spread from point to point, so that there is not a state in the union from Maine to Florida, from New York to California, where the principles of public education, as advocated by Horace Mann, are not accepted and upheld, — in some cases, with a liberality of which Mann and his contemporaries never dreamed.

As an estimate of his life, I will read to you a few lines from the writer already quoted, Dr. Hinsdale: "Still Mr. Mann's greatest services to education must be sought in another quarter — in the field of institutions, organization, administration, legislation, and public opinion. He was a great constructive peda-

gogist, a wise educational statesman, an eloquent tribune of the common school. He called upon the people of all classes, as with the voice of a herald, to raise their estimate of public instruc-

Wood Working Shop.

Physical Laboratory.

tion, and to provide better facilities by which it could be furnished. He devised or adopted new educational agencies, and persuaded the people to use them. He organized public opinion,

and influenced the action of legislatures. He gave men higher ideas of the work and character of the teacher at the same time that he taught the teacher to magnify his office. He heightened the popular estimate of the instruments that are conducive and necessary to the existence of good schools. He elevated men's ideas of the value of ethical training, and made valuable suggestions looking to its prosecution. But his great theme was the relation of intellectual and moral knowledge to human well-being, individual and social. Here his faith never faltered, his ardor never cooled. In no other name did he trust for the safety of society."

As I rise from the perusal of many pages and of many books, the estimate that I have formed of Horace Mann is this. He was one of the wisest, ablest, farthest-sighted, most practical and most useful men among those of our countrymen who have devoted themselves to public instruction. He had the limitations of his times. Modern psychology was not born, — and we find him groping after the facts that we now know, as to the relations of mind and brain, by an acceptance of phrenology and by endeavors to solve the problems of cerebral action by the scrutiny of exterior bumps. He was a disciple of George Combe, whose advocacy of careful rules of physical life were of immense service, in England and the United States, to all who are trying to lead an intellectual life. He knew but little of the philosophy of education and cared but little for its history. But he had strong convictions as to its necessity for the happiness of the individual and of the State. All children should be taught, and schools should be sustained, liberally not niggardly, by the public purse. These opinions he advocated with the authority of the post to which he was called, by the fervor of his eloquence, and by the facts that he collected and printed in his annual reports. He encountered opposition, even from the Boston schoolmasters, — but this only made him the more valiant. With patience, courage, timeliness, and forethought, study and faith, he fought and won the battle for the improvement of public schools, — "good enough for the richest, cheap enough for the poorest." One great contribution did he make to the school system of the State, he introduced, advocated and developed that precursor of this Teachers College, the State Normal School. Of the doctrine that teachers must learn the

art of teaching, however much they learn besides, he was the wise and successful defender. You may well believe the words of Hinsdale, that "normal schools were the apple of his eye," if I read you his own words.

Chemical Laboratory.

Domestic Art Room.

"I believe normal schools to be a new instrumentality in the advancement of the race. I believe that without them free schools themselves would be shorn of their strength and their

healing power, and would at length become mere charity schools, and thus die out in fact and in form. Neither the art of printing, nor the trial by jury, nor a free press, nor free suffrage, can long exist to any beneficial and salutary purpose without schools for the training of teachers; for if the character and qualifications of teachers be allowed to degenerate, the free schools will become pauper schools, and the pauper schools will produce pauper souls, and the free press will become a false and licentious press, and ignorant voters will become venal voters, and through the medium and guise of republican forms an oligarchy of profligate and flagitious men will govern the land; nay, the universal diffusion and ultimate triumph of all-glorious Christianity itself must await the time when knowledge shall be diffused among men through the instrumentality of good schools. Coiled up in this institution, as in a spring, there is a vigor whose uncoiling may wheel the spheres."

I do not know whence came the notion that teachers can be trained for their work, but on an occasion like this, we certainly ought not to forget the name of Jean Baptiste La Salle, who founded two and a half centuries ago, the Society of Christian Brothers, and taught his followers how to teach the minds of the young. His work still goes forward in many distant lands. Not many months ago, in the basilica of St. Peter's in Rome, I saw the ceremony by which, with all the ceremonies of an august and ancient rite, the Pope canonized this illustrious and devoted schoolmaster. It was an interesting indication of the spirit of the times, that the two worthies then selected for ecclesiastical distinction were a skillful nurse, Rita di Cascia, and the teacher of teachers, Jean Baptiste La Salle. We have no Pope, no consistory, but we have an "Order of the Aureole." And in that Order, made up of those who have devoted their lives to the service of humanity, we shall find enrolled, by common consent, the name of Horace Mann, orator, teacher and reformer.

Before I close, let me lead your thoughts away from the city, the university, the college, and the school, where this discourse began; let me ask you to look out upon the civilized world, afar and near, and consider what is in progress. We are certainly living in a period of re-construction, re-adjustment, re-nascence, not in one field but in many. Time is annihilated in our exchange of thoughts; distances at sea and on land are

Domestic Science Laboratory.

Fourth Grade Room.

shortened by rapid transit; the newspapers compel a daily consideration of events in every part of the great round world; new problems of municipal government are forced upon attention by the growth of cities; the relation of Western civilization to Eastern conditions, with all its complex problems, engrosses the anxious hours of statesmen, warriors, and scholars; science is directing its infinite eyesight into the most recondite spheres; invention snatches from the discoverer every new principle or law, and seeks to apply them all to the benefit of mankind; religious doctrines are revised and simplified; and at the base of all these changes is Democracy, the triumph of popular suffrage, popular legislation, popular instruction: Democracy, the rule of the people in politics, religion, and education. We may regret the indifference to authority; we may prefer the dominion of hereditary classes, the continuance of traditional ways and doctrines, the calm and quiet days when thought was inactive and researches were unknown. That makes no difference with the mighty forces of education. Unceasingly, they unfold new lessons, new opportunities, new instruments, new problems, new benefits. Each century, each generation has advantages, enjoyments, utilities, opportunities, excitements and obligations enjoyed by none of its predecessors.

As teachers, our responsibilities are multiplied in this period of renascence. We are carefully to consider whether the methods we employ, the lessons we convey, the vistas we open, the tasks we impose, are adapted to the requirements of society in this time of endeavor and hope. More than ever, education is of transcendent importance to the welfare of society, and the training of Teachers demands liberal measures and methods, liberal arrangements, liberal resources.

Two questions seem to me above all others to demand our earnest consideration. First, how can the youth be taught to understand the physical world in which we live; how can the exact methods of scientific thought be best calculated; how can the mode of discovering truth, and eliminating error, in problems of every kind, be most wisely inculcated? Certainly it is not by learning facts, nor committing names to memory; certainly it is not by encouraging original investigation among the immature and inexact; certainly it is not by the acquisition of a smattering of useful knowledge. It is chiefly by cultivating the

spirit of truth, the modest, humble, patient, cautious, inquisitive, and persistent spirit which accepts the teachings of nature and looks upon science as the interpreter of this mysterious world, where the Creator has given us our brief home, a world of infinite beauty, attractiveness, complexity, a world fitted for the development of mankind for higher, nobler, and happier lives. This is a far-reaching inquiry: — how can we learn, how can we impart the lessons of nature, — which is only another way of asking how can we understand and interpret the laws of God.

Sixth Grade Room.

The second question is how can we train the young to help on, in the most efficient way, the improvement of society, how can the duties of citizenship, by those who do not vote, as well as by those who have the ballot, be exercised most efficaciously; how can the young be prepared to uphold when they grow older by voice, pen, and conduct, the principles of good government? How can they learn to contribute to the welfare of others? How can they be taught that though we speak with the tongues of

angels, and though we have all knowledge, yet if we have not that charity which shows an intense and abiding interest in our fellowmen, we are but sounding brass and tinkling cymbal.

ABSTRACT OF REMARKS

By Dr. NICHOLAS MURRAY BUTLER, Acting President of Columbia University

It is a privilege and a very great pleasure to add a word on behalf of the University to what has already been said this afternoon. The University welcomes, and welcomes heartily, this splendid addition to the equipment with which these mighty institutions are pressing forward in pursuit of a common educational ideal. We are glad to have here on Morningside Heights one more impressive monument of the wisdom and the generosity of those New Yorkers who believe in education. We recognize the care and intelligence with which this building has been planned. We see in it the evidence of the skill and power of the modern architect, and we observe the fitness and appropriateness it has for its needs and purpose. For all of these reasons, the University wishes to share in the expressions of gratitude to the generous donors who have made it possible. Long may they be spared to reap a rich harvest of happiness in witnessing its usefulness to generations of the city's children.

It is not an idle boast, nor is it merely to call attention to a haphazard coincidence, to point out that here on this site, for the first time in the history of education, a child may enter the kindergarten and go forward under the influence of one tendency and ideal, in unbroken course, until he passes out into the world with the highest honors of a modern university.

There is no difference in dignity between the work of the school, that of the college, and that of the university. The dignity is one. The stage at which it performs its work is a different one, but the work itself is common to all.

One word of a man who would be very happy if he could be here this afternoon. Twenty years ago, the venerable scholar who was then rounding out his career as President of Columbia University, told the public and the Trustees that Columbia University could never be complete until it had an ideal school con-

nected with it and under its influence. President Barnard pointed out what he thought the ideal school should be, and it is an interesting fact that the men and women who have worked to plan and to complete the Horace Mann School have produced an institution which is according to the ideal of President Barnard.

The Library.

Therefore, the Horace Mann School is doubly welcome to Columbia University, — welcome on its own account, and welcome on account of him whom we all delight to honor and to revere. May the influence of this school grow stronger and deeper year by year, and may it be a vital force in the uplifting not only of this community but of our beloved country.

THE NEW HORACE MANN SCHOOL

By SAMUEL T. DUTTON

Superintendent of the Teachers College Schools

Its Aims and Ideals

No spot in New York, and perhaps none in the country, attracts more visitors than the tomb of General Grant. Anyone standing upon the heights which are crowned by that imposing mausoleum and looking toward One-hundred-and-twentieth Street sees immediately in front of him and a little to the left of Barnard College the new Horace Mann School. Extending along the entire block from One-hundred-and-twentieth to One-hundred-and-twenty-first Street, its commanding position and attractive architecture make it a most conspicuous object. As one approaches the building he sees that its single turret supports the weather-vane in the form of a pen. This was a happy thought of the architect; for while the proximity of this edifice, designed as a temple of learning, to the tomb of America's greatest soldier, might seem to suggest an antithesis, there is in fact none here. The pen is not mightier than the sword when both are wielded for freedom, for union, and for humanity. The close of the civil war and the dawn of peace so earnestly desired by General Grant marked the beginning of a national movement for the education of all the people, alien races included, in which the self-denial and patient persistence in well-doing on the part of the South has only been equalled by the high-minded altruism and generosity of the North. The true purpose of education in this country has been revealed when it has been employed not only as a means of increasing civic intelligence, but also as a method of saving and elevating to Christian manhood and womanhood the poor, the neglected, the ignorant and the unfortunate of the land.

I purpose, here, to treat briefly some of those relations which this institution has sustained and will continue to sustain to Teachers College, to its patrons and to the larger community to which it ministers.

First, its relation to Teachers College: What the school has been and what it is would not have been possible except for the vital connection it has sustained to the college. The founders and supporters of the college and of the school have endeavored to show how the whole child may be educated, and have sought to find a proper balance between physical, manual, intellectual and æsthetic training as applied to this end. From first to last the aim has been to follow the natural aptitudes of the child to be educated, and at the same time to add that nurture

Principal's Office, High School.

and culture which long experience has shown is needed for the highest improvement of the race. The professors in the college and the instructors in the school constitute a group of persons earnestly seeking to work out the many problems of the new education. The best that experts could devise has found its actual application in the school-room work. Results have been secured through cultivation rather than through manipulation; so the Horace Mann School has been to Teachers College much more than an experiment station or a laboratory. It has been a

garden in which every plant receives its proper fertilization and care. What flowers and fruit are to the gardener, the interesting and ever-changing phases of child life and achievement have been to professors and teachers.

In its new home the Horace Mann School is likely to become more and more a grand object-lesson to all who come to Columbia University for the study of education. Less important is it that those in training for the profession of teaching should give instruction than that they should see a perfectly organized school, complete in all its equipment and administered in deference to the best known principles of physical and mental hygiene. The plan recently adopted of having a superintendent of the several schools, who is also professor of school administration in Teachers College, ought to favor both unity and efficiency.

By a recent gift to Teachers College, a new building will soon be erected for a free school. The plans for this school will permit experiments in education upon the social side which have not been hitherto attempted. Here students of the college will be permitted to render assistance not only in teaching but in making the school distinctively a social centre. This new venture will not only relieve the pressure which has been felt to some extent in the Horace Mann School, but will greatly broaden the field of activity for all connected with Teachers College.

In general it may be said that the relations of the Horace Mann School to the College will remain very close and intimate. They are one in spirit, in motive and in purpose. The faculties of each are in close touch, and there will be no attempt at separation excepting where convenience and the easy dispatch of business require it.

Second: The importance of the relations sustained by the Horace Mann School with its patrons is very great. Those who entrust their children to the school are usually those having faith in broad and progressive education. They believe with the lamented General Armstrong that the head, the hand and the heart are to be educated simultaneously. Hence they are unusually loyal to the school, to the teachers and to the ideals for which they stand. When parents' meetings are called, they give quick and cordial response, and criticise the methods of the school in frank yet sympathetic manner. As a standard of what should

exist throughout the country, this union of parent and teacher is all-important. The most active coöperation of the school and the home is essential to success. The school is proud of its intelligent and appreciative patronage, and should ever seek to honor every just desire of its patrons.

Third: Teachers College, through its affiliation with Columbia University and its rapid growth, has become a national institution. The Horace Mann School, which is its right arm, must rise to a position of increasing importance in relation to the

The Studio.

higher life of the city and the country. Nothing in the world is greater than education. It cannot take off its hat to Christianity, for it constitutes in itself the very essence and mission of Christianity. Its propaganda as touching the cultivation of mind and heart and the redemption of the race are those announced by the Master himself. Education pays the highest tribute to the church as supplying that leadership by which man rises to a more spiritual life; but the church would be helpless to-day without the school, for it is almost the sole agency for the

culture of good habits and the shaping of character. So the Horace Mann School will proceed to promote not only a sound education, but also a higher personal and civic sense of duty. It will endeavor to illustrate not only what good teaching is, but what is meant by " fulness of life."

The Horace Mann School cannot, like the great schools of England, boast of its antiquity or honorable traditions. It cannot, like the Winchester School, for instance, show its wooden porringers from which students for several hundred years have eaten, or its venerable water-spout in the yard where shivering youths were required to wash themselves in the most frigid weather; neither can it like Rugby and Eton point to ugly but sacred school rooms scratched and hacked by the most illustrious Englishmen of the past. Here everything is fresh and young. The new building, with its noble entrance hall, spacious architecture, tinted walls, and appropriate furnishings, will be like a clean tablet upon which is to be recorded all that the future brings either of good or ill. But it may safely be affirmed that the life and the effort of the school in its new environment will not be unworthy of the generosity and faith which have provided such a building.

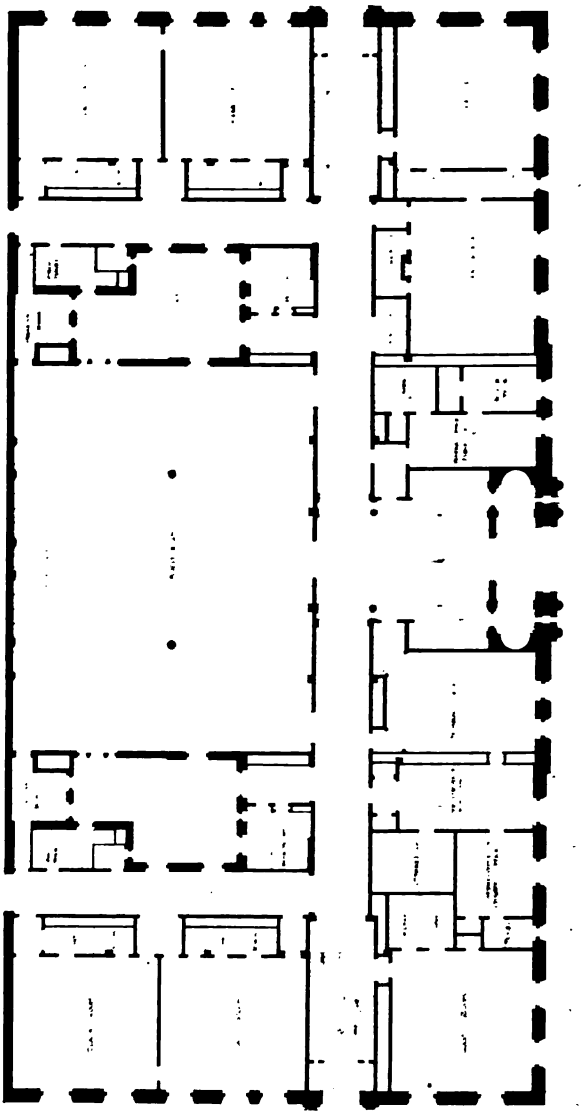
The Horace Mann School Building

The building is located on the westerly portion of the square bounded by Amsterdam Avenue, the Boulevard, One-hundred-and-twentieth and One-hundred-and-twenty first Streets. It extends along the Boulevard the whole length of the block. It is built of brown Longmeadow sand stone and red brick, similar to those used in the Teachers College building. Its style is suggestive of both Gothic and Renaissance, and while it resembles the Teachers College in general tone, it differs enough to afford some variety. It contains a basement and four stories in addition to the space in the roof which is so well lighted as to constitute practically a fifth story, all of which will be used as necessity requires. The windows are large and are grouped in such a way as to afford ample light to all the class rooms, without affecting unfavorably the architectural effect. Considerable attention has been given to details at the entrances of the building

so as to make them attractive. The structure is about 200 feet in length by 100 in breadth. It is finished throughout, except the basement and the studios upon the fifth floor, in antique oak highly finished and polished. The basement extending the whole length of the building contains on the easterly side, in the centre, rooms for the heating and ventilating apparatus, consisting of motors, fans and pumps. At the northerly end along the Boulevard is the Gymnasium, measuring 88 x 30 feet, with a gallery extending across one end, adjacent to which is the office for the director, with dressing rooms. The Gymnasium is well equipped with all kinds of ordinary apparatus, including a rowing machine. On the other side of the corridor are large rooms furnished with lockers, shower baths and service baths, and also dressing rooms. Three hundred and eighty-four lockers were furnished by Messrs. Merritt & Co. of Philadelphia. These lockers are arranged in double tiers, and each locker is supplied with a Corbin brass lock. These lockers, being open on all sides, afford the opportunity of drying the clothing. In the girls' department the lockers are provided with backs, and adjacent to each group of eight lockers is built a dressing room of hard pine. There are 24 of these rooms, thus affording perfect privacy. Each locker room has a dressing room attached for instructors and has separate communication with the Gymnasium.

Midway in the basement is a large stock room and work shop for the janitor and his assistants, and on the opposite side a bicycle room with space for several hundred wheels. Next comes a smaller room containing the switch boards for the electric-lighting, the front portion of which is used for a book store. The southern portion of the basement contains a lunch room 96 x 42 feet, accommodating 300 persons at table, with the necessary kitchen and serving rooms. These are equipped with the most approved steam tables, ranges, urns, etc.

The principal entrance to the building is on the Boulevard, leading directly into the entrance hall, which runs through two stories and is considerably decorated. It is lighted by a beautiful lantern of green glass. Opposite the entrance is the tablet erected to the memory of Caroline L. Macy by Valentine Everit Macy and Edith Carpenter Macy, who are the donors of the building. In the centre of the entrance hall there is a large statue of the Lemnian Athene, and on the staircases which are on either side



Ground Floor Plan.

and on the opposite wall of the corridor are bas-reliefs of the Madonna and Child by Benedetto da Maiano, Madonna and Child by Michel Angelo, and Boys and Girls Singing and Playing on Instruments, by Luca della Robbia.

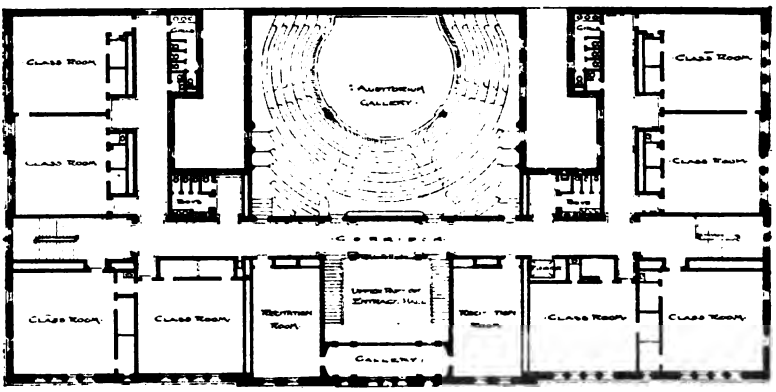
Facing the main entrance is the principal door of the Auditorium. At the left of the entrance hall are a large reception room, handsomely furnished in mission furniture, and the offices of the superintendent of the school and secretaries. At the left of the entrance hall are the offices of the principal of the Elementary School.

The Auditorium, 54 x 70 feet, being placed centrally on the ground floor of the building, is easily accessible. It extends through two stories with the gallery opening directly from the main corridor of the second floor, which is reached directly by the staircases in the entrance hall, to which reference has been made. The Auditorium accommodates about a thousand persons, and the seats are arranged in curved rows so as to face the platform, and upon sloping floors both above and below. The ceiling directly over that portion of the Auditorium not occupied by the gallery is almost entirely filled by stained glass, as are also the windows above and below on either side. In the upper windows there are scrolls containing the names of the leading colleges for men and women. The Auditorium is decorated in green tints: the entrance hall is in buff and terra cotta, while the other portions of the building that have the most sunshine are in green, and the remaining portions in buff.

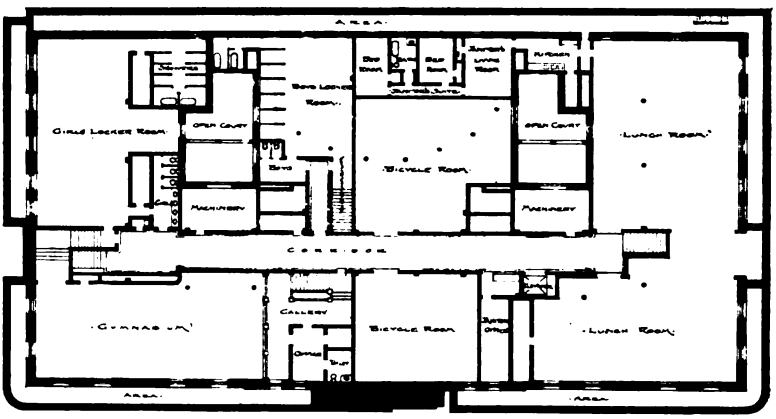
The first floor contains seven class rooms. On the second floor are to be found the Auditorium gallery, eight class rooms and two recitation rooms, one of which has been fitted up as a sitting room for the teachers of the Elementary School. The third floor contains the offices of the principal of the High School, a Library, 41 x 31 feet, which opens with folding doors into the corridor and also, on either side, into sitting rooms for the High School men and women teachers respectively. There are also on this floor six class rooms, an emergency room, and three recitation rooms. The fourth floor has two laboratories for pupils of the Elementary School, five class rooms, and six recitation rooms, and two small conference rooms. On the fifth floor there are two art studios, with specially constructed roof affording abundance of northern light. The first and second

floors are occupied by the Elementary School, and the third and fourth floors by the High Schools. At either end of each floor there are toilet rooms for both boys and girls, with private dressing rooms for the teachers.

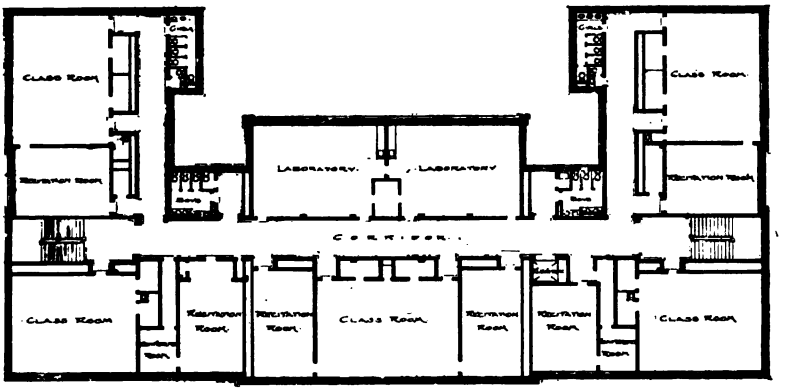
The building is provided with a large Otis elevator, running from the basement to the fifth floor. There are about 800 electric lights and 57 electric clocks. The system of local telephones used in the Teachers College is extended to the principal rooms of this building, as well as the city telephone. The corridors and rooms are adorned by carefully selected pictures and casts. The class rooms are furnished with the Chandler adjustable chairs



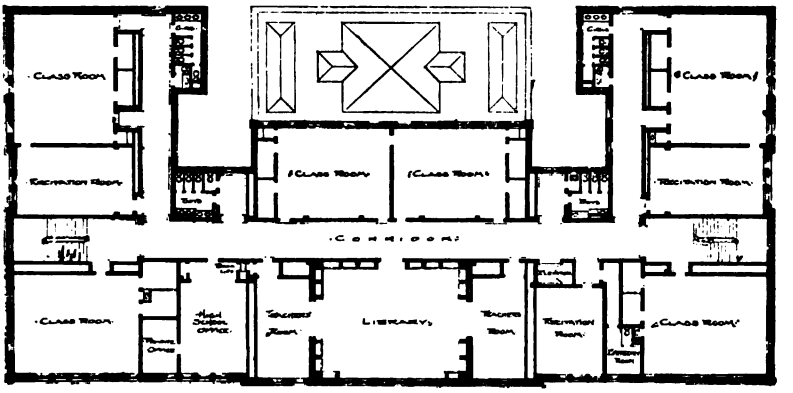
Second Floor Plan.



Basement Plan.



Fourth Floor Plan.



Third Floor Plan.

and desks, and the recitation rooms by the Wellesley tablet chairs. There is a book lift connecting the first floor with the fourth. For the convenience of students and teachers, the building is connected with the Teachers College by a covered passage.

The architects of the building were Edgar A. Josselyn and Howells and Stokes, associated architects. The builders were Norcross Bros. The heating plant was put in by G. A. Suter & Co., with A. A. Sanborn as consulting engineer.

The Horace Mann School is heated by what is called the indirect system, air being delivered to the different rooms at a temperature sufficient to provide all heat, and, at the same time,

furnish an air supply of 30 cubic feet per minute to each pupil of a class of 30. Direct radiators are also placed in the halls and some small rooms. The regulation of the temperature of the air is accomplished by a system of specially arranged steam coils controlled by Johnson thermostats, the air supply from outside the building passing at first through large primary steam coils placed directly in front of the fan and being heated to about 70 degrees, the temperature being regulated by thermostats in the main flues. From this point it is driven to the separate flues which lead to the rooms. At the foot of these flues are placed secondary coils which heat the air to a higher degree, if that given by the primary coils is not sufficient to heat the room. These coils are controlled by thermostats placed in each room, which cause the steam to enter the secondary coils, if the temperature of the room falls below the desired point, and shuts the steam off when this point is reached, the whole system being automatic. A number of the direct radiators are also controlled in a similar manner.

As a large volume of air is constantly being driven into the rooms, a corresponding amount has to be taken out, and this is done by exhaust fans in the roof which draw the air from ventilating registers in the rooms through flues leading to the top of the building, where it passes through the fans and is discharged through the large ventilator on the roof. The air which is taken from the rooms is that which has become vitiated and cooled and which has settled to the lower part of the room, the vent registers being placed in the walls near the floor.

Under normal conditions, the air which is to be heated for the building is taken from the open court-yards, but in the early morning hours when the air does not need changing, it is allowed on very cold days to settle down through the building as it cools and is led to the fans in the basement which re-heat it and send it again through the building, instead of taking in cold air from out-doors, an arrangement planned for economy.

The steam for the system is brought a distance of over 300 ft. from boilers in the Teachers College. The thermostats are operated by compressed air from steam pumps, and the fans are run by electricity which is also supplied by the Teachers College plant.

DEPARTMENTAL NOTES

SECONDARY EDUCATION

Teachers College announces the appointment of Dr. Julius Sachs, New York City, to the professorship of Secondary Education. The department to which Dr. Sachs has been called is now fully established for the first time. A general course on Secondary Education has been offered during the past two years by Dean Russell and Professor Monroe, but the work has grown to such proportions that a full professorship is necessary. Dr. Sachs will bring to the department ripe scholarship and wide experience in secondary school affairs. He graduated from Columbia University, A.B. 1867, and took his degree of Ph.D. in Rostock, Germany, 1871. He was also a student at Würzburg, Göttingen and Berlin. In 1872 he established his Boys Preparatory School now located on Fifty-ninth Street, near Fifth Avenue, and since 1891 has also been Principal of the School for Girls established in the same neighborhood. He was President of the Schoolmasters Association in 1889; President of the American Philological Association in 1891; President of the Middle States Association of Colleges and Secondary Schools in 1898; President of the Head-Masters Association of the United States in 1899, and President of the New York Society of the Archæological Institute since 1900.

Dr. Sachs' services to secondary education include also his work as a member of the Latin Conference Committee under the Committee of Ten of the National Educational Association in 1892; as a member of the Latin Auxiliary Committee of the Philological Society's Committee of Twelve in 1896. He has also been active in the establishment of the College Entrance Examination Board of the Middle States and Maryland, which has lately extended its work to all parts of the country, and from the

beginning he has been connected with it as a representative of the secondary schools.

The courses which will be offered by the new department are: (1) A general course on Secondary Education, to be given on Tuesdays and Thursdays at 4.30 and open to graduates and specially qualified seniors. This course will consider the purposes and subject-matter of secondary education; the systems of instruction prevalent in American and in European secondary schools; the questions of administration and of arrangement and adjustment of the curriculum; the educational phases in the apportionment of subjects; it will dwell on the general questions of sequence and choice of courses, on equipment of the secondary school and upon its relation to the elementary school and the college. (2) A course open to graduates only on the Curriculum of the Secondary School. This course will be devoted to a critical investigation of the courses of study offered in various types of secondary schools in this country and abroad with the purpose of working out curricula which shall be in accord with American ideals and requirements. (3) A Seminar on Secondary Education in which graduate students will receive training in investigation and research while preparing dissertations for the higher degrees.

It will be seen that the establishment of this department completes the scheme of Teachers College for the training of teachers and administrative officers for secondary schools. There are now fully equipped departments in Biology, Domestic Art and Domestic Science, English, Fine Arts, French and German, Geography, Greek and Latin, History, Manual Training, Mathematics, Music, Physical Education, and Physics and Chemistry. These departments are concerned with the training of special teachers in their several fields, and the courses provided consist of academic work, which is for the most part conducted by the graduate faculties of the University, the history and principles of education, psychology and its applications in teaching, and special teachers' courses on the theory and practice of teaching the several subjects. The students entering these courses must have specialized in the subjects which they intend to teach during three years of their college course. College graduates who are proficient in psychology and the history and principles of education may become candidates for a Master's diploma in secondary teaching.

This course in secondary teaching was established in 1898 when fifteen students became candidates for the secondary diploma. In 1900 the number increased to forty-five, and in 1901 to seventy. There are now in the College 109 candidates for the various diplomas in secondary teaching. Of this last number fifty-three are College graduates, and many of them have had experience in teaching.

With the facilities which the College already possesses, supplemented by the appointment of Professor Sachs, it may be said that Teachers College makes as complete a provision for the training of secondary teachers as for teachers in the lower grades. In America this is an innovation, but in France and Germany it has been systematically conducted for many years. The high degree of efficiency attained in German secondary schools fully justifies the efforts which have been expended during the past seventy-five years in the training of German teachers. If the Teachers College of Columbia University can demonstrate the possibility of increasing the efficiency of American secondary schools by the professional training of teachers, it fully justifies the hopes of its friends for the advancement of public education and the promotion of the public good. J. E. R.

THE SPEYER SCHOOL

LOCATION — The Speyer School — at present consisting of a kindergarten with forty children, and the first four grades with nearly sixty — is housed in two separate buildings on Lawrence Street, nine blocks north of Teachers College.

The kindergarten occupies a large and pleasant room in a brick annex to St. Mary's Church (Protestant Episcopal), and the Primary School is suffering innumerable inconveniences in a small, private house near by, having desks on two floors, a cooking room in the basement and a sand and general work room on the third floor. But these inconveniences are very patiently borne, since a magnificent new five-story building — made possible by the munificence of Mr. and Mrs. James Speyer, to be located in the same neighborhood — will be ready for the use of the school one year from next Autumn. It will accommodate both the present kindergarten and primary school, and four

grammar grades as well, besides allowing room for numerous kinds of settlement work.

NATURE AND PURPOSE OF THE SCHOOL — About two-thirds of the parents of the children in the Speyer school are of German extraction, while the others are largely foreign-born. As they include mainly shop-keepers, teamsters, janitors, policemen, and street-car conductors, the home advantages are nearly the average for those of New York public school children, and the school is, therefore, broadly representative of conditions found in all of our large cities.

The purpose of the school is to furnish a field for the development and application of educational theory in a much freer way than the Horace Mann School can allow. The latter, being a private school with high tuition, furnishes excellent opportunities for observation of the best school practices, but it permits of comparatively little student teaching. The Speyer School, on the other hand, admitting pupils entirely free of tuition, can allow much more practice teaching and experimental work.

PRESENT KINDS OF WORK — Aside from the instruction of the children by the regular teachers, the kinds of work now carried on by Teachers College in connection with the Speyer School, are seven in number, namely: Outside classes in Domestic Art, Outside classes in Domestic Science, a Mothers' Club, Girls' Social Club, Library Work, Practice Teaching and Experimental Teaching.

Outside Classes in Domestic Art — There are three of these classes, which meet after school hours of Friday afternoon, i. e., from three to five o'clock. Some of the pupils of the Speyer School are members, but most of them are older public school children living in the neighborhood and taking sewing also in their regular school work. The aim is to build on their previous knowledge and turn it to account in practical problems of construction. There are ten to fifteen members in each class, and the youngest ones (ages six to eight) are engaged in raffia and cord work, and coarse sewing. The second class (ages ten to ten) are learning to sew well, doing the simpler kinds of work that their mothers must do at home. The third class (ages ten to thirteen) are aiming to make and repair their own clothing. They work both by hand and on the sewing machine, and are trying to sew well and rapidly enough to be of use at home and to stran-

gers. Each child brings one cent each lesson, which helps to buy the material. Very small articles are given to the workers, when completed, but large garments are purchased by payment of the cost of the material. That the work may be truly practical the oldest class should practice on real garments. To accomplish this, a scheme is on foot to have half-worn garments sent to the school, which, on being mended, will be distributed among needy children elsewhere. But it is the ambition of these girls soon to repair garments well enough to receive pay for such work. All of this work is conducted by students from Teachers College.

Outside Classes in Domestic Science — These classes, which are to be five or six in number, are just being organized. As above, they are composed of public school children, ten to fifteen years of age, and eight to ten in a class, and are conducted after school hours on most of the days in the week. Each class meets once per week from three-thirty to five o'clock. Their work includes both cooking and the care of a home.

The Mothers' Club — This club is composed of about fifty women, most of whom are mothers of children in the Speyer School. It is well organized for execution of business and is entirely supported by voluntary contributions from its members. In fact, it now has thirty-five dollars in the treasury, and no debt. Two meetings per month are held, one in the afternoon and the other in the evening. Instruction in sewing is one prominent kind of work in the afternoon. Occasionally a physician talks before them on the care of the health of young children, and it is the intention to have a course in nursing.

Some of the evening topics for discussion have been, The Plays of Children, How to Keep Christmas, Care of Sick Children, etc. Twice per year the fathers are invited in the evening, and there is then a special program, followed by refreshments. At the last meeting of this kind, held January 9th, the subject was " Obedience of Children," and graduate students from Teachers College had charge of the program. In all there were about twenty members of this University class present, four of whom gave short talks, while four others assumed the special responsibility of seeing that the discussion was lively and profitable. The other members present, on the basis of these observations and other past experiences, each drew up a set of theses, touching the

Conduct of Parents' Meetings in general, which served as topics for later discussion in their University course in Education.

Girls' Social Club — There are two divisions of this club, one consisting of girls from eight to twelve years of age, the other of those from twelve to seventeen years of age. They meet once per week in the evening in separate rooms in the brick annex to St. Mary's Church. Three kindergarten students take charge regularly of the younger division, and one kindergarten student, together with one of the young lady graduate students in Education, now has charge of the other. Physical exercises are regularly given to both divisions by still another college student. Many of these girls would otherwise spend the evening upon the street, and the object of this club is, therefore, social enjoyment as well as physical improvement and some instruction.

Library Work — The school library, which is free, consists of several hundred volumes adapted to adults and to children, and about two hundred persons are now drawing books. The library is in charge of the Teachers College Alumni Association, and the school building is open three times per week for the drawing and the reading of books.

Practice Teaching — Many of the methods courses in Teachers College are necessarily confined to the Horace Mann School for their practical work, as those dealing with the High School and with instruction in the grammar grades. But there are probably from fifty to sixty students who this year are doing most or all of their practice teaching in the Speyer School. Nearly all of these are either college seniors or graduate students, and a majority are experienced teachers.

Experimental Teaching — This term is used to designate the instruction given in the Speyer School by about twenty of the graduate students. In one sense, their teaching is practice work of the ordinary kind, since they prepare plans and receive criticism the same as do other students. But while the latter merely give instruction on topics assigned by the regular teachers, and are interested chiefly in a proper method, these graduate students are actually experimenting on the curriculum itself. The conclusion has been largely agreed upon in this course, that the present instruction in even the better Primary Schools is too theoretical in character, and that the first need is that of a curriculum more closely in touch with daily life, and calling for more motor activ-

ity. Accordingly, the students are introducing in part somewhat new subjects of study, one line of work during the first year of school being a study of surrounding occupations, including the work within the home itself. In the second and third grades primitive life is a prominent subject, with a special attempt to reproduce primitive processes in acts, rather than in words. Several of the students have together undertaken to improve the subject-matter of Arithmetic in the Primary, and several more, that of written Language work. The assumption throughout all of this work is that final conclusions as to what children can best study in school have not yet been reached, and that it is the special function of graduate students in Education to carry on intelligent experimentation in this field, just as it is done in many others. F. M. McM.

EDUCATIONAL PSYCHOLOGY

The members of the seminary in Educational Psychology this year are investigating the nature and relationships of some of the abilities concerned in the school subjects, the extent to which these abilities are hereditary, the extent to which they result from mere growth or maturity on the one hand and from special training on the other, and the influence of various disciplines upon them. From the work of this year and last, the following facts have already been demonstrated: The efficiency of any mental function in an individual is largely dependent upon the nature of the data on which the function is employed; for example, quickness and accuracy in certain movements have no connection with quickness and accuracy in perception or association; the efficiency in any individual of some functions, for instance, spelling, is to a very great extent determined by inborn capacity, whereas the efficiency of others, for example, the accuracy of perception of words, is largely due to interests, habits, etc., the acquisition of which is a matter of training; the improvement due to any given training tends, in general, to be restricted to the particular function trained, spread of the effects of training to other functions occurring chiefly if not solely only in so far as these functions and the function trained contain identical elements. Some of this work has already been published in three articles by Dr. R. S.

Woodworth and Professor Thorndike in the May, July and November numbers of the *Psychological Review* and in an article by Naomi Norsworthy and Professor Thorndike in the September *Journal of Pedagogy*. The bulk of it will eventually appear in psychological and educational journals.

Volume Nos. 3 and 4 of the Columbia Contributions to Education are made up of Notes of Child Study by Professor Thorndike. These notes present those facts concerning the physical and mental development of children which it is proper for teachers to know and are intended for an introduction to the systematic study of genetic psychology.

Professor Thorndike delivered three lectures at Asheville, North Carolina, on September 30th and October 1st, the topics being The Teacher as a Student of Children, The Evolution of the Mind and Animal Intelligence. On October 7th he spoke before the Passaic Teachers' Association. E. L. T.

MATHEMATICS

The professional work in the Department of Mathematics during the first semester has been confined to the course in Education 23, on the Theory and Practice of Teaching Mathematics in Secondary Schools, and to the course in History of Mathematics. The course in Education 23 has included two lectures each week, with thirty hours of practical work in the Horace Mann School. The class has taken up by means of discussions and papers, as well as through lectures, the consideration of the general objects to be obtained in the teaching of mathematics in the high schools, the typical courses of study in this and other countries, and the bibliography of the subject, devoting the first semester largely to a discussion of the subject of algebra. In particular, such modern features of the science as are set forth in the works of Bourlet, Pincherle, Petersen, and the writers of the modern German School have been brought before the class by means of lectures and discussions. The practice teaching has not been confined to the Horace Mann School. Model lessons have been given in the class by the various members. In order, however, that these lessons should be examples of real teaching, the subjects taught have been those with which the class as a whole was

not familiar. These lessons have been preceded by written plans, which have been criticised by the instructor, and they have been followed by criticism in which the class has been allowed to take part.

Since students are not allowed to enter this course until they have had at least nine points' credit in college mathematics, only those who are entirely fitted in the way of subject-matter for work in the high schools are in the class. It is the aim of the Department to insist on the highest academic scholarship before permitting anyone to take the course, and upon the highest educational ability before recommending anyone for positions in the high schools. Some members of the class have taken all of the mathematics offered in one or two large universities. Others have had considerable experience in teaching the subject in the high schools. All have had at least the subjects of the calculus, analytical geometry, trigonometry, and higher algebra.

The course in History of Mathematics is considered of as great educational value as the one already mentioned. The work is carried on by means of lectures and assigned topics for investigation. It is confined almost entirely to the mathematics of the high school and the first two years of college. It is open only to seniors and graduates whose mathematical courses have been approved, and hence the members of the class are thoroughly prepared to undertake work of this nature. Since most of them read French and German, in which languages the literature of the subject is largely found, it has been possible to make them acquainted with the standard authorities. The University Library is rapidly adding to its mathematical works, and is doing this in such a way as to offer exceptional facilities to those who care to study thoroughly the evolution of the science.

In the second semester the course in the Theory and Practice of Teaching Mathematics in Elementary Schools is offered.

The number of students taking the work is such as to warrant the establishing of a Practicum in the History and Teaching of mathematics, open to those who have had the courses already mentioned. This work will be offered next year. D. E. S.

MUSIC DEPARTMENT

In the Music Department there is much that is new this year. The department itself requires three new courses, an advanced course in Sight Singing, a course in Musical Education, and one in Musical Art. Since the removal of the Horace Mann Schools to the new building, the music in the grades is carried on through an assistant, Miss Stevens. In the Speyer School two lessons a week are conducted by Professor Farnsworth and six lessons a week by one of the members of the class in Musical Education. The academic requirements for entrance to regular work in the department are so unusual for music students that it is very gratifying to find that there are any who can do the work. The education class is fortunate in having among its members those experienced in teaching, so the work in the Speyer School is effectively carried on, its scope being increased. At the same time the teaching students have an excellent opportunity for practice work.

This year, for the first time, courses for voice are given, Mrs. Caroline Mehan conducting these lessons. It was found that to do the work well each student needed to be taken alone and her peculiar difficulties observed. Hence, the first semester's work has been done individually. The plan is now to put the students in small classes. Especial attention is given to the speaking voice, the singing tone making an excellent stepping-stone to a well placed and musical speaking tone, the connection between the two requiring careful practice. C. H. F.

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CHEMISTRY AND PHYSICS

IN THE

HORACE MANN HIGH SCHOOL

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TEACHERS COLLEGE RECORD

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CHEMISTRY AND PHYSICS

IN THE HORACE MANN HIGH SCHOOL[1]

By JOHN F. WOODHULL

Professor of Physical Science in Teachers College, Columbia University

INTRODUCTION

"Science is not solely for the men of science but for the people."
—T. H. HUXLEY

If the phrase, "A self-respecting course in physics or chemistry," means one adapted only to the few, the courses herein described are not intended to come in that category. We believe that physical science should be so taught in the high school that all pupils can pursue it with pleasure and profit. It should be something more than *measurement* and something more than mathematics, pure and applied.

Those who would prescribe work in science for the high school must have just as thorough knowledge of the pupils as they have of the science.

[1] Chemistry and physics are taught to a considerable extent in the Elementary Department of the Horace Mann School. The topics are scattered through the courses in Nature Study and Geography. For the details of the course in Nature Study see Vol. I. No. 2 of TEACHERS COLLEGE RECORD, published in March, 1900; and for the course in Geography see Vol. II. No. 2 of the RECORD, published in March, 1901. The present number of the RECORD deals only with courses in Chemistry and Physics in the High School, with the exceptions mentioned on pp. 43–50.

In certain quarters physical science is suffering most at the hands of its friends. Persons devoted more to the science of the subject than the science of the pupil are pursuing a method of work which repels the pupils and dissatisfies the parents. Pupils at the age of fourteen or fifteen come to the study of chemistry and physics with enthusiasm, if they can find some one willing to teach them what they want to know in order to live contentedly in a world that is bristling with physical phenomena. Too often high-school pupils are put off until the latter years of the high-school course; and then the teachers, fearful lest their work may be stigmatized as unscientific or superficial, dare not give them more than the grammar of the subject. What excuse is there for the idea that nothing must be taught unless it can be taught thoroughly, or, for that matter, unless it can be taught correctly! Those who do not know that their facts are subject to revision are unsafe teachers and certainly are not to be classed among the scientists. Meanwhile the teachers of other departments have, with more of the spirit of missionaries and with more of the wisdom of educators, innoculated these pupils and absorbed their interests until they have become insistent upon lines of study and habits of thought quite remote from those of physical science. It thus happens that although physical science is very much in the ascendency in the world it is still very much neglected in many of the schools.

The apathy for all branches of science among pupils even of the high-school age is a real thing, but a thing for which parents and teachers are to blame. It is displaced by enthusiasm in the case of pupils who are introduced early to laboratories.

The principal thought in the minds of those who have planned the courses in chemistry and physics for the Horace Mann High School has been to provide work in these subjects suited to the need of the average pupils, boys and girls, without special requirements of previous training either in mathematics or other sciences, and as early in the high-school course as possible. In point of fact, chemistry is taught in the first year and physics in the second year of the high-school course. The question will naturally arise, Do these courses fit for college? The answer is that more than 80 per cent of the pupils of the Horace Mann High School do fit for college, and a good portion of them offer chemistry and physics for entrance

examinations. During the thirteen years that these courses have been in operation a large number of boys and girls have passed from them into all the leading colleges in the East. However, we believe these courses aim at something more than fitting for college. They are planned to meet the needs of those boys and girls who are inquiring into the phenomena of the physical world about them.

The undercurrent of our thoughts while planning and executing these courses is indicated by the following phrases contributed to this paper by the workers in the department in response to my request for a statement of what seemed to them to be our guiding thoughts. (It is of course understood that we claim no monopoly, but are laboring in common with many other departments toward the same end or ends):

"Awaken interest in natural phenomena — the significance and importance of such phenomena, and the explanation of those which are most familiar."

"Satisfy the love of the novel and wonderful."

"Observe and think about what one observes — the classroom exercise being a small part of the process."

"Organize every-day observations — Associate facts — Light up one fact by another."

"Observe facts — compare with other facts — recognize laws which govern them — Formation of scientific habit of thought."

"Develop the powers of induction and deduction."

"Think logically and draw correct conclusions — form accurate judgments — Ability to weigh evidence."

"Ability to distinguish between the true and the false — Create a desire for the truth — Conservatism — Open-mindedness — Distrust of imagination when untempered by reason."

"Interpretation of Nature — We are limited on all sides by physical laws. We need to understand them so that we may not undertake physical impossibilities. We make unreasonable demands — We make ourselves and others unhappy by not knowing and not yielding to the inevitable — The reign of natural law."

"Ability to act on contingencies — Training in prudence and foresight."

"Executive ability — Self-confidence — Dexterity."

"Skillful manipulation a mental training."

"Concentration — Accuracy — Patience — Carefulness — Neatness."

"Constructive imagination."

"Stimulate, by laboratory work, powers of imagination and invention."

"Draw the attention away from the abstract to the practical."

"Applied mathematics — Contact with machines — Common sense."

"Fit for life — Open a field in the economic world — Knowledge of physical science in every profession and business. Adoption of scientific method in everything."

"Clearness of thought and expression — Use of exact and terse English."

"Furnish a fund of valuable information."

"Broadening one's views of life."

"Aid in general culture."

"Physical science lends itself readily as an instrument for illustrating the best pedagogical principles."

The above list is submitted not as a record of work done, but as the object of our desires.

Our Reasons for Putting Chemistry before Physics. — During the first few months of high-school work in science special attention should be given to training pupils in good laboratory habits, and pupils in the early part of the high-school course are at the right age — about thirteen to fifteen years — to begin to learn the mechanical side of laboratory work. For this purpose I prefer chemistry in the first year, followed by physics in the second year. It is possible to put nearly all of the chemical apparatus in the hands of each pupil. Test tubes, beakers, and flasks constitute most of this equipment, and need not cost more than two or three dollars per pupil. This is not true of physics. No one expects to have physical apparatus enough to supply each member of his class with every piece, and hence the pupil in physical laboratory work must be a little more capable of self-direction on that account. The mechanical part of laboratory work in chemistry may, and I believe it should be, made simpler than that of physics. When the experiments are

going badly in the laboratory, as they frequently will with beginners, the teacher performs an experiment in the presence of the class, discussing the difficulties as he proceeds, and when he has finished has them all try the same experiment. In this manner he trains the pupils to do things as they ought to be done and to see things as they are. We teach them to bend a delivery tube that approaches pretty closely to some model taken as a standard. We train them to transfer powders to test tubes without getting any upon the tables, or even upon the sides of tubes; to invert a bottle of water for catching gases without admitting any air; to heat test tubes and flasks without breaking them; to use acids without spotting the tables or the clothing or the labels upon the bottles; to generate chlorine, hydrogen sulphide, etc., without contaminating the air of the room. If they are not so trained when they are quite young they are hopeless. The college professor who gets hold of a lot of careless students finds that he is quite helpless. He can do very little toward reforming their laboratory habits. Indeed, while the first high-school class will submit very willingly to this training in painstaking, careful habits, the third and fourth year pupils are already getting beyond that stage.

2. We put chemistry before physics, not only because it enables us better to introduce young people to laboratory methods so far as the mechanics of these go, but also because it may, and we believe it should, be treated as a simpler subject than physics with reference to training in thought power. The high-school text-books in chemistry are simpler than those in physics. It is true that portions of both subjects are not understood by the pupils. Most of the portions of chemistry, however, which the first-year high-school pupils do not comprehend will not be comprehended by the fourth-year high-school pupils either, and these portions may very properly be left for the college course. Chemical theory has very little place in the high school in whatever year the subject is taught. We treat the subjects so that *combustion* in chemistry is simpler than *heat* in physics; the *chemistry of water* simpler than the *mechanics of fluids;* the chemical conduct of chlorine, sulphur, nitrogen, carbon, etc., simpler subjects of study than electricity and sound. I find that chemistry lends itself very readily to the training of young pupils of thirteen or fourteen years of age, not only in the mechanics of the laboratory,

but also in the more important process of making experiments lead to orderly thought. Pupils of that age can be readily taught all the chemistry necessary to fit for college, so that we are not hampered by that consideration. The work is certainly no more difficult than the algebra which they are taking the same year.

3. The books that we wish the pupils to read in connection with their work in physics all come under the head of applied science. Such books invariably have the subject matter of chemistry and physics commingled. A sufficient number of them are well adapted to the attainments of our second-year high-school pupils. They would have little connection with a course in chemistry, but they are an important part of a course in physics for those who have had an elementary course in chemistry.

SCIENTIFIC OBSERVING. — The great aim of science teaching is to accustom the mind to logical arrangement; to make one thought grow out of another; to so arrange things that one phenomenon shall appear in its relation to another; so that one fact may throw light upon another; to organize our every-day observations. A person thinking much on some question, the answer for which he expects to find in nature, is liable to see things which cast light upon his problem, while at the same time he may be very unobserving of those things which do not help toward the answer of his question. This is scientific observation. Children are natural observers. They only need to be taught to select for a definite purpose, and to connect one observed fact with another. This, I imagine, is what Professor Huxley meant when he said, " Science is merely organized common sense." The number of observations which a person may make in a given time is often inversely proportional to the amount of thinking he does. A child and his father go to walk. By the roadside they both notice some object as they pass along. The father, having had a wider experience, finds something in this object which starts a train of thought. The child, not being so occupied, sees numerous other objects which the father fails altogether to notice, or, if he does notice them, they flit across his mind without making any impression; but presently an object attracts his attention, and because it is related to the first it attracts his attention more than it does that of the child. The number of objects seen by the child during that walk may be vastly more than the number seen by the father, but the father has seen related things; he has

seen to some purpose; he, of the two, is the scientific observer; yet, if some one asks whether they passed a certain gate, the boy will be likely to be the only one who can answer. Now, no teaching can enable the boy to see more things, but training may enable him to think more about what he sees. Some one has said that a good memory requires a judicious forgetfulness; so scientific observation requires that the mind shall not be distracted by observing a multitude of unrelated things.

CHEMISTRY AND PHYSICS AS A KEY TO THE WORLD OF SCIENCE. — Elementary chemistry and physics furnish simple inductions. We may select our facts in physical science and arrange them so as to make the conclusions to be drawn from them as simple as we choose. Nature performs many physical experiments in a large way — too large for the youthful mind to encompass. We may perform in the laboratory experiments which represent the large phenomenon piecemeal, and thus build up the conception of the whole, and at the same time develop the constructive imagination which is needed to grasp the processes of nature. Often we may devise for the laboratory a miniature representation of the larger phenomenon of nature which shall be quite a perfect analogy. This not only shows the possibilities of laboratory work in chemistry and physics, but I believe it indicates in a general way a very important aim to be kept in view, viz., to select as far as possible such work as should prepare the way for the contact with physical science in life and particularly with such matters as city water and gas works, heating and ventilation of buildings, the uses of steam, electricity, etc. See Excursions, pp. 43-50.

As a result of these courses and those in Manual Training, to which they are closely allied in spirit, pupils become more self-dependent in mechanical matters and save themselves and others much loss and annoyance. Their parents testify that whereas it used to be necessary to send often for an electrician to adjust the electric bells about the house, their children have now learned the few simple things necessary to be done to keep them in good order. They put new washers upon leaking water faucets. They replace nuts which have come off the handles of bureau drawers, and screws that have fallen out of the door knobs. They read the water meter and the gas meter. They understand the mechanism of the furnace and their special instruc-

tion about what to do in case of fire has resulted in the prompt extinguishing of several fires in the homes that gave promise of being very disastrous. They are more generally useful than formerly and some new interests have been added to their lives. If they grow up to be masters, they will more wisely direct their servants because of their better understanding of these practical matters and will probably have fewer "servant problems" on that account.

If the high-school instructor in chemistry and physics would perfect himself he must take in addition to ample courses in pure science, as many courses as possible in applied science and come much in contact with the business life of the world.

THE RELATION OF HIGH-SCHOOL WORK TO COLLEGE WORK. — While we regard the high-school work in chemistry and physics an almost essential preparation for the general courses in chemistry and physics in college, they are not planned to complete any portion of the subject so as to make college work in that portion unnecessary. So far from the high-school work in chemistry and physics taking the interest out of the college work, it increases it fourfold, and, so far from its creating in the student bad habits either of doing or thinking, which will require to be corrected in college, it begets habits essential to good work in college; and if the pupils fail to receive this training in the high school it is very difficult for the college instructor to accomplish wholly satisfactory results with them.

There is no objection to giving high-school pupils a general view of chemistry and physics even if they are going over the same ground again in college. On the contrary it is in every way advantageous so to do. All the great principles of chemistry and physics have entered the mind of the race in that way. "Contemporaries were at first little impressed with the truth, self-evident though it may now appear to all men." It had to be repeated and sometimes rediscovered.

CORRELATION WITH OTHER SUBJECTS. — We expand quite fully those topics which appeal most to the pupils. Such topics are wrought out to the fullest extent in their application to physical geography, meteorology, astronomy, biology, physiology, cooking, the phenomena of the kitchen, the factory, the shop, the farm, etc. This is not intended to interfere with the more extended study of physical geography, physiology, cooking, etc..

afterwards. It gives the best possible introduction to them, and at the same time makes the chemistry and physics mean much more than they otherwise would. These subjects are too often treated like a course in grammar. Too much attention is given to learning the definitions of things not immediately useful.

RELATION OF LABORATORY, RECITATION, AND LECTURE. — As a rule laboratory work goes hand in hand with lectures and recitation work, otherwise neither could be brought to fruition. Laboratory work is too often merely mechanical. Students may become adept at working with instruments of precision without gaining any outlook upon physics, without acquiring any habits of induction, or the faculty of seeing relations. I take it that the training of the constructive imagination is equally important with training in accuracy. Our idea of the relation of laboratory, text-book work, and lecture I have stated in New York Regents' Bulletin No. 42, published in 1897, and quote it here:

"THE LABORATORY. — The chief purpose of the laboratory, in the high schools at least, is not for the exercise of the inductive method. Fascinating and fruitful as that method is in the hands of a few ripe scholars, it is often a snare and a delusion in the hands of the young or of the untrained adult. With great care pupils should be trained in the process of induction for its own sake, but not with the idea that that is the method by which they are to be taught any considerable portion of science. There is small chance for induction in the teaching of high-school chemistry or physics. Mechanics and light furnish the best opportunity for the use of that method. The chief purpose of the school laboratory should be to make knowledge real. Merely to see a piece of apparatus aids immensely one's appreciation of the physical principle which the apparatus illustrates, but when one manipulates the apparatus himself he acquires a knowledge of physical science which he can in no other way attain. In order that a laboratory exercise may be productive of good, two things must be looked out for; first, the pupil's mind must be carefully prepared for it beforehand. Nothing is more common than to find pupils going through their laboratory exercise in a mechanical way without acquiring much knowledge of the physical principles involved; and second, the pupil's mind must be guided to some definite end. This in most cases can be done by quizzes following more or less closely the laboratory exercises; but fre-

quently, to prevent desultory and aimless work, it is necessary to conduct quizzes either of individuals or of the whole class during the laboratory exercises. High-school pupils cannot with profit be left much to themselves in laboratory work. They need very specific written or printed directions. They must also have a discreet teacher, who will keep very busy supervising the work of each pupil while in the laboratory.

"Laboratory work is so apt to be a blind following of directions without much thought upon the relation of the work, that we find it necessary to sprinkle among written directions a great many queries and problems intended to lead the pupil out from the observation upon the individual experiment in hand to kindred observation in other experiments or in nature, that he may acquire the habit of looking for relationships and of making broader generalizations.

"Laboratory work requires as good solid thought as does a recitation; indeed, there must be considerable of the recitation feature about it. To accomplish this the division must not number more than twenty-five, and the instructor must have an assistant capable of helping in his work of going about among the pupils while at their work, and giving the right kind of guidance and of asking the right kind of questions. This assistant is also assigned the large and important task of examining critically the pupils' laboratory note-books, and discusssing with each pupil such matters as need correction.

"THE TEXT-BOOK. — The earlier text-books were faulty in that they covered too wide a range of subjects and dealt too much with paradoxes. They seemed in many cases to be a deliberate attempt to make things seem unnatural and unreal. There was the hydrostatic paradox and the culinary paradox, the Cartesian diver or bottle imp, the 'fountain in vacuo,' the 'Hero's fountain,' the 'Bacchus illustration,' the 'bolt head,' etc. These were the topics around which the instruction centered, and these formed the items of examination questions. The text-books to-day have discarded much of this material, but they have become extremely meagre and uninteresting. They still deal with too many principles, but treat them too meagerly. A principle is stated in a brief paragraph. This paragraph is followed by a description of a single experiment, and then another principle is served up. In many cases that which occupies half a page might better be

expanded to cover a dozen pages. Silvanus Thompson's *Elementary Lessons in Electricity and Magnetism* illustrates fairly well a good form of expansion of the text. But in addition to such matter as is to be found in this book, and perhaps with the elimination of some of it, I should recommend filling out the text-book with what might be called adipose tissue — the abundant illustration of each principle with well-told incidents in every-day life — something calculated to make the pupil see physics in the world around him. Such expansion of the text-book might make it necessary to have it bound in several volumes. The pupil has an armful of books for Greek or history or English; why not for physical science? It must be so if the latter is to take its place among the former as a disciplinary and a culture study. As in history or English so in physical science, there must be extensive use of the library. Topics should be assigned which require the student to consult books of reference, not merely for tables of boiling points, etc., but the reading of magazine articles, of encyclopedias, and of volumes like Faraday's *Chemical History of a Candle* and Tyndall's *Forms of Water* and *Heat a Mode of Motion.*

"There should be beside text-books and books of reference a laboratory manual containing very specific directions for the work to be done in the laboratory, a great deal of information concerning apparatus and experiments, a great many queries, mathematical problems, and supplementary exercises, etc. This book should be well supplied with blank pages upon which the pupil may disclose the state of his own mind.

"THE LECTURE. — A strong feature of good instruction in physical science is the lecture. The teacher of physical science should aspire to some reputation as an interesting lecturer. He has the best possible subject with which to attract an audience; why should he neglect the opportunity to interest and instruct and inspire by this method? Let him not despise the giving of university extension lectures for the good it may do himself. If he has learned how to enjoy the study of physical science in the laboratory, in the library, and in nature, let him inspire his students by giving them through his illustrated lectures a glimpse of his own broader view upon the subject. By lectures he can make physics and chemistry real, live subjects as nothing else can possibly do."

There are certain chapters in physics which must be treated chiefly in lecture and recitation; the laboratory work plays only a small part. There are two means of adjusting in such cases; first, we use some of the laboratory period for extra lectures and recitations; and second, we introduce some laboratory work which, although needful, may be irrelevant. This is the case in the early part of the course, where the laboratory work is upon the metric system and mensuration, while the lectures and recitations are dealing with properties of matter, gravitation, motion, etc. During a portion of the study of heat and sound the time of lectures and recitations is increased at the expense of laboratory work. During a portion of the study of the dynamics of fluids and electricity the laboratory work is increased at the expense of the lectures and recitations.

SYLLABUS OF THE COURSE IN CHEMISTRY

TIME. — First year of the high-school course. Pupils about fourteen years of age. One year of thirty-two weeks. Two exercises of forty minutes each and one exercise of eighty-five minutes weekly, with two hours of home study, making four hours and forty-five minutes each week. One period of forty minutes is devoted to a lecture when all the divisions of the class meet together in the large lecture room. The period of eighty-five minutes is given to laboratory work and the remaining period of forty minutes is devoted to recitation, or, in some cases, to extra laboratory or lecture work as the subject may demand.

THE CHEMICAL LABORATORY. — Each pupil has assigned to him in the laboratory a desk with a drawer or cupboard. Running water and gas are at hand, a stone jar under the desk for such waste material as cannot be removed by the waste pipe. The sinks are of the ordinary household type of porcelain bowl. The tops of the tables are oak finished with wood filler and oil. The laboratory training is intended to teach the uses and limitations of waste pipes and the proper care of tables. Laboratory hoods are provided for such experiments as would vitiate the air of the room. Reagent bottles are not allowed to stand continually upon the laboratory tables. They are kept in a case, and are distributed about the tables upon asbestos mats for each exercise in which they are required. It is intended that the laboratory shall be as attractive as the library and its decorations will some day be as complete.

When the pupil first reaches the laboratory he finds the material for most of his apparatus in his drawer and cupboard, with a printed list giving the name of each piece. This material is committed to his charge as specified on the bill. He may draw more from the stock room as he needs it, which will also be added to his account. There is a teacher's desk at one side of the room, around which supplementary lectures are given and recitations are conducted. A working shelf runs along one side

of the room underneath the windows, where electric current is supplied and where the balances are placed when there are to be experiments in weighing. Cases are provided for reagents, chemicals, exhibition apparatus, books, etc.

For text-books we use Remsen's *Elementary Course* and Woodhull and Van Arsdale's *Laboratory Manual.* Definitions and chemical principles are brought in rather incidentally but recurrently throughout the course whenever good illustrations arise to enforce them.

In this manner the following matters are taught in gradual sequence of development, and after they have been once introduced they are taught repeatedly, so that they are not easily forgotten: chemical nomenclature; symbols; formulas; reactions and equations; definite proportions; oxidizing and reducing agents; atoms and molecules; effects of light, heat, electricity, and solution upon chemical action; mechanical mixtures and chemical compounds (acids, bases, and salts); valence; the nascent state; indestructibility of matter; combining weights.

OXYGEN AND THE AIR. — The first month is devoted to the study of oxygen. In this case, as frequently throughout the course, a lecture introduces the laboratory study of the subject, and other lectures follow the laboratory work. By the end of the month we expect the pupils to know that oxygen makes many things burn; things which burn in the air burn more readily in oxygen, but the result appears to be the same; some things which do not burn in air burn readily in oxygen; in the atmosphere oxygen is mixed with other gases; the air causes some metals to rust, this also is due to the presence of oxygen; methods of protecting iron from rusting; rusting and burning are similar processes, differing only in the rapidity of the chemical action; when metals rust there is an increase of material; about one-fifth of the air is oxygen; only this takes part in rusting and combustion; the products obtained by burning in air and in oxygen are the same. Kindling temperature. Miners' safety lamp. Heat of combustion. Chemical energy. Oxides. Oxides in nature. Respiration. An oxide of carbon. Lime-water test. Ordinary combustion. Lamps. Furnaces. What to do in case of fire. Fire extinguishers. The Bunsen burner. Explosive mixtures. Several of these topics, notably, *What to do in case of fire,* are expanded into full lectures, and are intended to present

practical applications of the principles already studied. Certain portions of the text-book are assigned for first reading before those topics are treated in the laboratory, a second reading and more careful study to be made after the subject is worked over in the laboratory.

The pupil's first laboratory duty is to bend the glass delivery tube and set up the apparatus represented in Fig. 1.[1] This is used, with slight modifications, to generate all gases in the course. The eight-ounce, wide-mouthed bottle, the tin basin, the test tube, the rubber stopper and even the delivery tube being repeatedly used all the year.

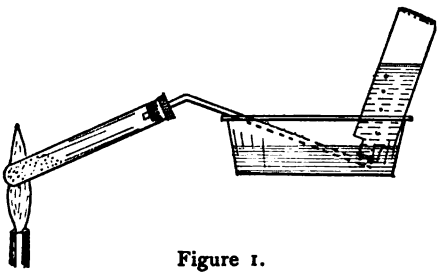

Figure 1.

The manganese dioxide and potassium chlorate already mixed, are distributed upon small pieces of paper. The pupil folds this piece of paper as a physician rolls up a powder, leaving the ends open, and transfers the powder to the bottom of his test tube without clouding the sides of the tube. He is not now instructed in the composition of the powder, because oxygen is enough for him to study at present.

The student soon acquires the ability to hold the apparatus in his hands with ease while generating gases. In this way he is enabled to watch it closely and guard against heating the test tube so as to crack it or melt it, also to guard against melting the rubber stopper or allowing the water to be forced back into the tube. It requires only a few laboratory exercises to make the awkward pupil more or less dexterous.

HYDROGEN AND WATER. — The following is learned from laboratory experiments: Hydrogen and air burn together. Hydrogen may be obtained from water. Oxygen may be obtained from water. Hydrogen and oxygen combine to produce water. Hydrogen and oxygen unite in the ratio of two volumes of hydrogen to one of oxygen. Hydrogen is found in illuminating gas, alcohol, ether, and a candle.

[1] The illustrations of chemical apparatus used in this number of THE RECORD are kindly loaned by Messrs. Henry Holt & Co., publishers of Woodhull and Van Arsdale's *Chemical Experiments*.

For generating hydrogen the same apparatus is used as for generating oxygen (Fig. 2), except that a two-ounce flask is substituted for the test tube to permit of effervescence without driving the acid over into the basin.

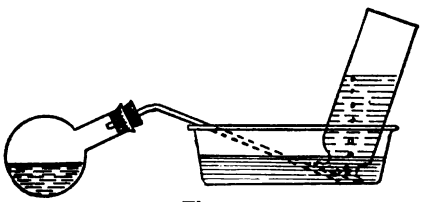

Figure 2.

From recitation and lecture the pupil learns of the prevalence of water in animal, vegetable, and mineral substances; water of crystallization; efflorescent and deliquescent substances; natural waters; impure waters; distillation; water as a solvent; water as an aid to chemical action; water gas; the oxyhydrogen flame and lime light; hydrogen dioxide, an unstable compound yielding oxygen in the nascent state.

The experiment of exploding a mixture of hydrogen and oxygen in the eudiometer is performed in the lecture room as follows: A graduated tube about 35 centimeters long is filled with water and inverted in a glass cylinder full of water which is about 30 centimeters long and 10 centimeters wide. About 12 centimeters of oxygen are passed in through a short delivery tube directly from the test-tube generator and allowed to cool until no further contraction takes place; then its volume is read, the eudiometer being raised until the level of the water inside and outside coincides. In the same manner about 12 centimeters of hydrogen are passed in through a short delivery tube from the two-ounce flask generator. This is allowed to cool and mix thoroughly and the volume of the mixture is read. A leather cushion, which has been soaked in water to get the air out of it, is placed under the lower end of the tube. The tube is clamped down and the mixture exploded by a spark from a Leyden jar or small Ruhmkorff's coil. The leather cushion is now detached and the water enters to within about 6 centimeters of the top of the tube. The volume of the remaining gas is taken after it has cooled. Then the tube is inverted and this gas is shown to be oxygen by passing into it a splinter of wood carrying a spark. The glass cylinder filled with water not only obviates the necessity of making corrections for pressure in the observed volumes of gas, but it makes it safe to stand near the apparatus in

case the eudiometer should be shattered by the explosion. No corrections for temperature are required, the water and gases being allowed to reach the temperature of the room. The whole experiment requires not more than twenty minutes, and, by the elimination of corrections for pressure and temperature, is brought within the capacity of a first year high-school class.

Another experiment which is performed in the lecture room is that of passing steam over hot iron powder. For this purpose the apparatus represented by Fig. 3 is used. The basin rests upon a support and the eight-ounce bottle is clamped in place. The rubber stoppers are pressed into the test tube and two-ounce flask firmly enough to support them. The hands are left free to control the two lamps. The water is kept boiling gently in the flask and the flame is moved slowly underneath the test tube so as to keep the iron powder as hot as possible without melting the test tube. The bottle is filled with hydrogen in a very few minutes. Then the delivery tube is lifted from the water in the basin before any water can be pressed back into the apparatus. Care is taken to keep the test tube tipped so that no water shall trickle toward the dry-hot end.

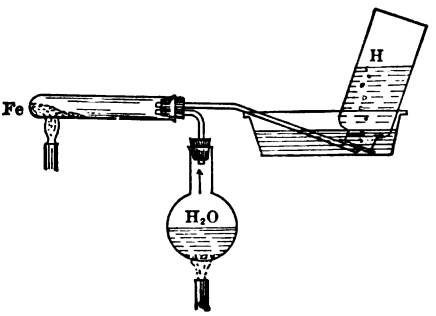

Figure 3.

The apparatus represented by Fig. 4 is used for producing water by passing hydrogen over hot copper oxide. The hydrogen generator is allowed to work for some minutes before the flame is applied to the test tube, to drive air out of the apparatus so as to avoid an explosion and to show that moisture does not collect upon the walls of the test tube until the copper oxide is heated.

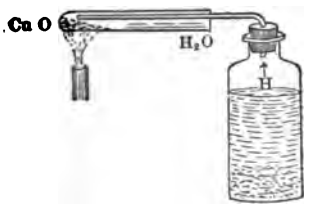

Figure 4.

The whole number of experiments performed in laboratory and lecture room is 8, as follows: 1. To generate hydrogen and show that it burns with air. 2. To obtain hydrogen from water

by means of sodium. 3. To obtain hydrogen from water by means of iron. 4. To obtain hydrogen and oxygen from water by means of an electric current. Proportion by volume, 2 to 1. 5. To show that hydrogen and oxygen when burned together form water. 6. To produce water by reducing copper oxide with hydrogen. In the discussion it is shown how the proportion by weight of hydrogen and oxygen in water might be determined from this experiment by weighing the copper oxide before and after the experiment and weighing the water produced. Thus, if the copper oxide weighed 2.38 grams before and 2.14 grams after the experiment, and if the water produced weighed .27 gram it is obvious that .24 gram of oxygen has been united with .03 gram of hydrogen to form .27 gram of water, and that 8 grams of oxygen would unite with 1 gram of hydrogen to form 9 grams of water. So far as possible such results throughout the course are made more real by being reported from the work of the teacher in his own private laboratory. 7. To cause hydrogen and oxygen to unite in the eudiometer proving the proportions by volume to be 2 to 1. 8. To burn a jet of oxygen in a bottle of hydrogen.

The following questions are typical of those given about once in two months to test the progress of the class:

Describe experiments which may be used to prove: (1) That water is composed of hydrogen and oxygen. (2) That it contains no other elements. (3) That it contains twice as much hydrogen as oxygen by volume. (4) That it contains eight times as much oxygen as hydrogen by weight.

Show how the experiments which you have described teach that oxygen is sixteen times as heavy as hydrogen.

A certain gas in burning united with sixty-four grams of oxygen and produced forty-four grams of carbonic oxide and thirty-six grams of water; of what two elements was the gas composed, and in what ratio by weight were they united in the original compound?

Why should there be a flame when sodium or potassium is put with water, and what is the product of this combustion?

Describe an experiment where an oxidizing agent and a reducing agent were used.

Suppose chemical attraction should cease, would any of the experiments you have performed be possible? Why?

How might you prove that air contains oxygen?

A test tube 6 inches long filled with air is inverted over water. A piece of phosphorus is allowed to rust in this enclosed air for several days, and at the end of that time it is found that the water has risen 1.2 inch; what per cent of the air has been used up in the rusting of the phosphorus? If we direct a flame toward the test tube until the phosphorus melts, will it burn? Why?

Why is there frequently a sudden burst of flame on a coal fire when the upper furnace door is open?

When carbon burns it unites with oxygen in the ratio of 12 to 32. If coal were 90 per cent carbon, how much carbonic oxide would be produced by the burning of a ton of coal? Some ocean steamers burn as much as 500 tons of coal in a day. What weight of carbonic oxide is thus produced? What volume? One pound of the gas will fill about eight cubic feet of space.

Name several observations common to every-day experiences that lead to the conclusion that air is necessary for burning.

When a flame is seen burning at the top of a foundry chimney, is it probably burning all the way down? If not, how may the flame have started? Give reasons for your answer.

Weight of tin taken 1.6 gram and the weight of tin oxide produced 1.8 gram. What per cent of tin oxide is tin and what per cent is oxygen?

12.25 grams of potassium chlorate will yield 4.8 grams of oxygen. An eight-ounce bottle of oxygen weighs about .35 gram, how much potassium chlorate will be required to fill the bottle with oxygen?

Composition of water is $\frac{H}{O} = \frac{2}{1}$, (vol.) and $= \frac{11}{88}$ (wt.); how much heavier is oxygen than hydrogen? If a liter of hydrogen weighs .089 gram, how much does a liter of oxygen weigh?

A liter of water weighs 1000 grams. How many liters of hydrogen and of oxygen will be produced by the decomposition of a liter of water?

What ratio of hydrogen to air would make the best explosive mixture?

CHLORINE AND THE CHLORINE FAMILY.—For generating chlorine the same apparatus is used as for generating hydrogen, represented in Fig. 2. In the flask is put a mixture of sodium chloride and manganese dioxide and a little sulphuric acid is

poured upon it. The chlorine gas is caught by passing it up into an inverted bottle of water. This is the most satisfactory way to catch chlorine. No trouble is experienced with the water rushing back into the flask, if a little more manganese dioxide than sodium chloride by volume is taken, if they are thoroughly mixed, and if the mixture is heated very gently. The pupils are taught to manipulate their experiments so that chlorine shall not escape into the air of the room. This is made possible without the use of the hood by catching it over water. All the experiments with chlorine are more successful if the gas is caught over water and well washed, than if caught by displacement of air. To wash any gas we close the hand over the mouth of the bottle, entrap some water along with the gas, and shake vigorously, throwing the spray through the gas, as the rain washes the atmosphere. This is the simplest and most effective way of washing a gas. Powdered antimony is sprinkled into chlorine, making a magnificent shower of sparks, and strips of colored calico and litmus paper are bleached in chlorine to show its marked chemical activity. Sodium is burned in chlorine to show its marked affinity for metals and to illustrate the existence of the chlorides in nature. The chemical activity of chlorine is exhibited by its power to bleach and disinfect and the reason for its not being free in nature is discussed. Chlorine is burned in hydrogen to give a broader view of combustion as a chemical process. Hydrochloric acid is made in the apparatus represented in Fig. 5. Sulphuric acid is put upon sodium chloride in the flask. Hydrochloric acid is passed over and absorbed in water in the test tube, which is kept cool by the bottle of water. The delivery tube extends nearly to the surface of the water in the test tube, but does not quite reach it. In a few minutes the water in the test tube becomes well charged with hydrogen chloride gas. Half of this hydrochloric acid is poured into a second test tube and zinc dropped into one tube to prove the presence of hydrogen, while manganese dioxide is added to the other tube to prove the presence of chlorine.

Figure 5.

Hydrobromic, hydriodic, and hydrofluoric acids are made by putting sulphuric acid upon the corresponding salts. The in-

stability of hydrobromic and hydriodic acids is noted. The effect of adding the oxidizing agent, manganese dioxide, in the case of hydrobromic acid is tried. Glass is etched by means of hydrofluoric acid. This is made a lecture-room experiment. The iodine and starch reaction is tried.

ACIDS, BASES and SALTS are discussed in the lecture and recitation; and in the laboratory, sodium hydroxide solution is treated with hydrochloric acid solution until it becomes neutral to litmus paper. The residue (NaCl) is filtered and evaporated to dryness over a water bath. The specimen is taken home and used. A small portion of it is tested with sulphuric acid to generate HCl, and another portion is tested with manganese dioxide and sulphuric acid to generate Cl.

Such questions and problems as the following are given:

Give a general formula for an acid; for a base. Indicate the reaction which takes place when they are brought together. What general name is given to the product formed? How would you make KCl? Na_2SO_4? $NaNO_3$?

How much caustic soda (NaOH) would be required to make one ounce of common salt? (NaCl).

Name another method by which salts are produced than by the neutralization of an acid by a base.

Name the sodium salt of hydrochloric acid; the potassium salt of chloric acid; the calcium salt of sulphuric acid.

What is produced in each case when potassium chloride KCl), potassium chlorate ($KClO_3$), and sodium nitrate ($NaNO_3$) are treated with H_2SO_4?

Compare Cl, Br, and I, stating the points of resemblance and difference from both the physical and chemical standpoints.

How would you distinguish by experiment between the chloride and bromide of sodium?

In general, how would you make any acid? How would you make hydrochloric acid? hydrobromic acid? nitric acid? carbonic acid? hydrosulphuric acid?

How much sulphuric acid and salt would be required to go with ten grams of manganese dioxide?

How much manganese chloride would be produced?

How many grams of chlorine would be produced?

How many liters of chlorine would be produced?

About how many eight-ounce bottlefuls?

SULPHUR.—The physical and chemical properties of sulphur at different temperatures are noted and its crystallization from a state of fusion and from solution; its low kindling temperature; its slight heat of combustion; its affinity for metals. Iron sulphide is made by mixing powdered sulphur and powdered iron and starting the chemical action by touching the mixture with a hot glass rod. A test tube is half filled with the above mixture and the experiment is repeated to illustrate combustion without oxygen. Hydrogen sulphide is made by treating a sulphide with sulphuric acid. This is compared with the way hydrogen chloride, hydrogen bromide, and hydrogen iodide were made. The instability of hydrosulphuric acid and its consequent usefulness as a reagent. Nascent sulphur. Test for the presence of hydrogen sulphide in eggs, coal gas from a coal fire, sulphur-spring water, etc. Products of the combustion of hydrogen sulphide with air or oxygen. Action of vulcanized rubber upon a silver coin. Making sulphides of metals by action of hydrogen sulphide on soluble salts of metals. Testing unknown solutions. Qualitative analysis. Making sulphuric acid from sulphur dioxide by the aid of an oxidizing agent. Making sulphur dioxide from sulphuric acid by the aid of a reducing agent. The use of sulphuric acid in making acids from salts. Importance of sulphuric acid in manufactures. Sulphur dioxide as a reagent. Its bleaching properties. For collecting hydrogen sulphide gas and sulphur dioxide gas we use the same apparatus as for generating hydrogen, illustrated by Fig. 2.

NITROGEN.—The instability of compounds of nitrogen. The action of sulphuric acid upon a nitrate. The action of metals upon nitric acid. Nitric oxide as a reducing agent. Nitrous oxide and nitrogen peroxide as oxidizing agents. Ammonia. Explosives. Nitrogen in foods for animals and plants. Oxidation and reduction products of the decomposition of substances which contain nitrogen. Destructive distillation. The analysis and synthesis of nitrogen compounds. Testing unknown substances for the presence of nitrates, chlorides, and ammonium compounds.

For the preparation of nitric acid, ammonia, and nitrous oxide, the apparatus represented in Fig. 5 is used. For the preparation of nitric oxide we use the apparatus represented in Fig. 2.

CARBON.—Experiments in the destructive distillation of wood, sugar, wax, and soft coal, are performed with the apparatus illustrated by Fig. 6. The solid products are left behind in the test tube. The liquid products are collected in the smaller bottle and the gaseous products gather in the eight-ounce wide-mouth bottle. The solid products which appear to be charcoal are afterward heated in an open tube and shown to yield carbon dioxide by the lime water test. They are then reduced to an ash by the complete combustion of the carbon. The liquid and gaseous products form the subject of a lecture or two with numerous experiments.

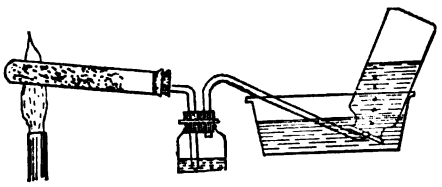

Figure 6.

The instability of organic things; their use as fuels and foods; their liability to decay; the charring of organic substances. The affinity of carbon for oxygen at ordinary and at high temperatures; products of the union. Presence of hydrogen in organic things shown by the formation of water in combustion. Presence of carbon in organic things shown by the formation of CO_2 in combustion. Relation of kindling temperature of hydrogen and carbon; smoky flames; lamp black. Manufacture of illuminating gas; coke. Coal, petroleum, natural gas. Diamond. Graphite. Carbon as a reducing agent. Lead is obtained from litharge by putting litharge upon a block of wood and directing the flame of the Bunsen burner downward and upon it until globules of the lead are separated out. This experiment is used to illustrate the extraction of metals from their ores by the smelting furnace. Charcoal filters. Oxidation and reduction products as illustrated in combustion, decay, the life processes of animals and plants, and destructive distillation from a retort or in the earth. Carbon monoxide in coal fires; in water gas. Marsh gas. Ammonia from compost heaps. Marsh gas in coal mines; fire-damp and choke-damp. Carbon dioxide in respiration; respiration of animals and plants. Use of hemoglobin and chlorophyl. Ventilation. Reason why carbon dioxide will neither burn nor support combustion. Study of flames. Heat and chemical energy

of the combustion of carbon; application of this energy in doing mechanical work. Fermentation by yeast. Soaps.

In the laboratory carbon dioxide is made by the action of an acid on a carbonate and the lime water test, and the flame of a burning taper.

We collect several bottles of air given off by the lungs in one breath and by lowering a burning taper into each bottle show that there is a larger portion of CO_2 in the last than in the first.

We show that CO_2 is produced by the action of the two parts of a baking powder on each other (sodium bicarbonate and cream of tartar).

We heat calcium carbonate to drive off CO_2 and obtain quicklime and slake the lime to obtain lime water; filtering the lime water and pouring some into a bottle of CO_2, shaking and adding lime water till the liquid remains turbid; filtering the hard water thus produced.

We make "hard water" also by dissolving a little chalk in "soda water," and boil some of the hard water to make it "soft."

We try the action of soap on the hard water produced in both of the previous experiments.

We show how mortar, plaster, whitewash, etc., become limestone by putting slaked lime into a bottle of carbon dioxide and tying a piece of sheet rubber air-tight over the mouth of the bottle, and noting the evidence that the CO_2 is being absorbed into the slaked lime.

To show that carbon dioxide and alcohol are obtained by the process of fermentation, we put yeast with a solution of molasses and water in an eight-ounce wide-mouth bottle and invert it in a tin basin and set it in a warm place. In a few hours the bottle is filled with CO_2, as may be shown by lime water or the burning taper. The solution of water, molasses and yeast which has passed out of the bottle and into the basin is now returned to the bottle and set away for further fermentation. In a few days it smells strongly of alcohol and a portion of it is put into the flask of the distilling apparatus represented in Fig. 5, and alcohol is separated out and shown to support a flame. The rest of the solution of water, molasses and yeast, is allowed to ferment further for many days until it makes good vinegar. This is filtered and put into a specimen bottle and labeled and kept to show to next year's class.

Yeast is examined under the microscope.

We also try the power of boiled and filtered yeast to cause fermentation. We make soaps by boiling fatty acids with alkalis.

We obtain potassium carbonate from wood ashes, and we obtain CO_2 by putting an acid upon wood ashes.

PHOSPHORUS AND ARSENIC.—Characteristics of phosphorus and arsenic. Affinity of phosphorus for iodine; for oxygen; use in making matches. The safety match. Allotropism as illustrated by phosphorus, carbon, sulphur and oxygen. Phosphoric acid and its salts. Properties of arsenic oxide; Marsh's test for arsenic. The nascent state as illustrated by the action of chlorine from aqua regia, sulphur from hydrogen sulphide, hydrogen in Marsh's test, the action of oxidizing and reducing agents. Products of the complete combustion of hydrogen arsenide, carbon bisulphide, hydrogen sulphide and a hydrocarbon like kerosene. Products of the incomplete combustion of the same when cool objects are brought into the flames. The affinity of oxygen for these elements in the free state compared with its affinity for them in the combined state.

IMPORTANT METALS AND THEIR ORDINARY COMPOUNDS.—A brief study of the preparation and of the properties of the following metals and a few of their ordinary compounds: potassium, sodium, (ammonium) and calcium; zinc, copper, mercury and silver; aluminium and iron; lead and tin; platinum and gold.

Special attention is given to those compounds which are of great importance in the laboratory, in the industries or in daily life; such as potassium chlorate, potassium carbonate, caustic potash, saltpeter, common salt, soda, borax, lime, mortar, gunpowder, glass, steel, porcelain, the common alloys, etc.

SYLLABUS OF THE COURSE IN PHYSICS

TIME.—Second year of the high-school course. Pupils about fifteen years of age. One year of thirty-two weeks. Two exercises of forty minutes each and two exercises of eighty-five minutes each, weekly, with two hours of home study, making about six hours each week. One period of forty minutes is devoted to a lecture when all the divisions of the class meet together in the large lecture room. The two periods of eighty-five minutes each are given to laboratory work and the remaining period of forty minutes is devoted to recitation. Sometimes one-half of one of the laboratory periods is used for extra lecture or recitation as the subject may demand.

THE PHYSICAL LABORATORY.—The physical laboratory is a large, well-lighted and well-ventilated room. On one side between it and the chemical laboratory is a stock room and an office opening into each laboratory; on another side are a dark room and a tool room. The tables are ordinary library tables, oak, and well polished, 2 feet 3 inches wide by 4 feet 6 inches long. Each table accommodates two workers. Although more than eight hundred students during the past eight years have performed their laboratory work upon these tables, and they have never been redressed, they still look quite as well as the tables that have been used for library purposes. The tables are arranged horseshoe fashion and are twelve in number. In the centre of the horseshoe are other tables which accommodate exhibition apparatus. At the opening of the horseshoe is a table for the teacher's apparatus. At one end of the room is a blackboard, a teacher's desk with twenty-four chairs grouped about it for recitation or supplementary lecture purposes. There is a sink at each end of the room and a working shelf running along two sides of the room underneath the windows. This shelf is supplied with electric current and with gas outlets for Bunsen burners. The apparatus is kept in the stock room and in cases around the sides of the room. Shelves are also provided for books.

THE LECTURE ROOM.—The lecture room is provided with 206 Yale-tablet chairs, an electric-light stereopticon, cases for exhibition and a lecture table well supplied with conveniences for chemical and physical lectures: a hood, a sink, a blackboard, a chart frame, gas, storage battery and dynamo connections; drawers and cupboards well stocked with lecture apparatus. A preparation laboratory opens from this room. There is intercommunication by telephone among the laboratories, lecture room, stock room and other rooms mentioned above.

For text-books we use Henderson and Woodhull's *Elements of Physics* and Woodhull and Van Arsdale's *Laboratory Manual.*

The pupils come to us at about fifteen years of age, desiring most to learn about trolley cars, wireless telegraphy, liquid air, the telephone, etc., and we are not convinced that it is our duty to check these desires and substitute what to them would seem to be dry husks. We therefore teach principles only for the sake of their applications and we very easily find their applications in the things which the pupils are inquiring about. Applications are presented so far as is practicable at the same time with the principles in order that they may give reality to the principles. High-school pupils are not satisfied to be kept "whetting tools" to be used only in college or in after life. What may therefore be considered the crowning features of our work are the excursions described on pages 43-50.

Physics may properly be regarded as a group of several subjects, as Heat, Sound, Light, etc., which, although closely related to one another, are not sufficiently interdependent to determine a natural sequence. This fact is well attested by authors of text-books in the wide variation of orders of topics which they have adopted. The order of topics is not very important so long as a logical and scientific treatment of them is followed. The best order to use in a text-book is not in all cases the best order to use in teaching the subject. It may be well, for purposes of ready reference, that the first division of the subject as presented in the text-book should be definitions of Physical Science, of the Constitution and Properties of Matter, etc.; but these and many other matters will be better understood if interspersed and reiterated throughout the whole course in teaching the subject. Minor considerations may very properly be allowed to determine the order of the chief topics. For example, we put that part

of the subject first which the introductory stages of the laboratory work require; we arrange our course to bring Static Electricity into the coldest and dryest month of the year, so that the experiments may be more successful.

PROPERTIES OF MATTER (*Two Weeks*)

The first lecture deals with: familiar illustrations to develop ideas of the molecular constitution of matter and of molecular force; the solid, liquid and gaseous states of matter and the relation of heat to these, and during the first week exercises are given in the laboratory to determine the ratio between an inch and a centimeter; an inch and a meter; an ounce and a gram; a quart and a liter; a cubic centimeter of water and a gram. In the second week the lecture and laboratory work treat very briefly of such properties of matter as are related to gluing, cementing, welding, soldering, the absorption of air and water by wood, and of oil by leather, the action of lamp wicks and blotting paper, the diffusion of vapors and gases into the atmosphere, the rising of sap in trees, the osmosis of gases and liquids in the human body, crystallization of water, type metal, etc.; the flowing, at ordinary temperature, of rosin, sealing wax, asphalt pavements, ice in glaciers, etc.; watch spring and spring balances, gold leaf, etc.

MECHANICS OF SOLIDS (*Three Weeks*)

The next three lectures present familiar illustrations and applications of the principles of momentum, mass and weight, gravitation and the laws of motion, the pendulum and its uses, uniformly accelerated and uniformly retarded motion, the path of projectiles, the orbits of comets and the planets, the recoil of a gun, the motion of the rotary lawn-sprinkler and simple turbine water wheel; the composition of parallel forces and the application of the principle to levers, pulleys, wheel and axle, balances and machines in general; work and the conservation of energy. The last two merely introduced now, but to be often referred to in future chapters.

The experiments which are used in the laboratory during the first five weeks have a little of the nature of induction, but more of illustration and of verification. Half of them have some-

thing of a quantitative nature, but perhaps not more than a quarter of them are what are usually termed quantitative experiments. They however serve the purpose of making *real* the ideas which we wish to present. They absorb the interests of the pupils, and when performed under the supervision of a good laboratory director and properly related to lecture and recitation work they furnish an abundant fund of information, and we believe they contribute well toward that mental training which we have in view.

MECHANICS OF FLUIDS (*Five Weeks*)

The study of the pressure in fluids is very much simplified by arranging it under three main propositions. It is understood that we refer to static pressure.

LIQUIDS.—The first proposition is (a) *Pressure in liquids is proportional to the depth alone, and is not influenced by the size or shape of the vessels which contain them.* (b) *At any given depth the pressure is equal in all directions.* The first part of this proposition is illustrated by such apparatus as is represented in Fig. 1,[1] and the second part is shown by such apparatus as is represented in Fig. 2. *b c* is in each case the vertical height of the mercury column which is supported by the water pressure at the point *b*.

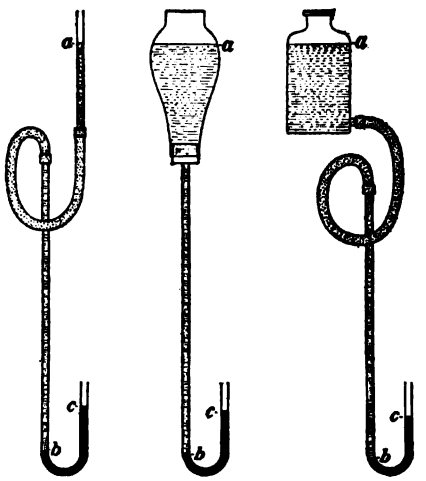

Figure 1.

The burden of the first lecture is to make this seem a naturally and necessary truth and not something paradoxical. Pressure downward, sidewise, and up-

[1] The illustrations of physical apparatus used in this number of THE RECORD are kindly loaned by Messrs. D. Appleton & Co., publishers of Henderson and Woodhull's *Physics*, and Woodhull and Van Arsdale's *Physical Experiments*.

ward, in a liquid is shown to be wholly due to gravity. Buoyancy and specific gravity are treated as merely corollaries of this proposition. For example, let Fig. 3 represent a specimen tube carrying shot and floating in a tumbler of water. If the depth *a b* to which it sinks is 10 centimeters, and if the area of its bottom is equal to 1 square centimeter, the pressure upward upon the bottom of the tube must be 10 grams, and since there is equilibrium, its weight must be 10 grams. It follows that: A floating body must displace its own weight of the liquid. A body that sinks until it is submerged displaces its own volume of the liquid. It will, if left free to move, sink to the bottom of the retaining vessel. It will press upon the bottom of the vessel with a force equal to its own weight, less the buoyant force of the liquid, which is the weight of its own volume of the liquid, which is the weight of the liquid displaced. If a string were attached to it and lifted it from the bottom, leaving it still submerged and this string were attached to a balance we might measure the force with which the object had pressed upon the bottom of the vessel. This subtracted from the weight of the object would give the buoyance, or the weight of the equal volume of the liquid, etc. This matter is discussed as long as it is fruitful, but specific gravity is not dwelt upon longer than one laboratory period. We sacrifice something from this work to find time to measure the water pressure at faucets on different floors of the building, from which we calculate the height of the stories. We measure the pressure in the gas pipes and steam pipes, the pressure which we may exert with our lungs. This is figured in pounds per square inch upon the walls of the mouth and chest, etc. We discuss what is meant by the draught of a ship; how her tonnage may be calculated; how it may be determined what

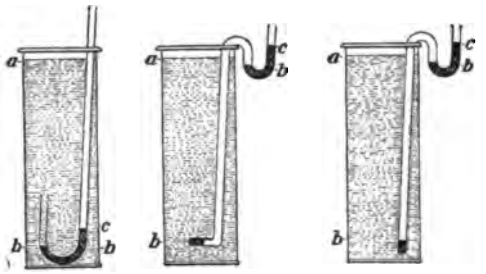

Figure 2.

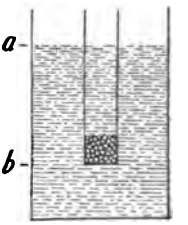

Figure 3.

water she will draw when loaded and when empty; how iron ships float; the use of ballast; why yachts have keels of lead projecting so far down into the water.

For home work, beside the study of the text-book, a number of experiments have been devised. One boy at our suggestion found the volume of his own body as follows: He filled the bath tub with water to the overflow and then carefully got in and submerged himself; he then got out and measured the amount of water which it was necessary to add to again fill the tub to the overflow. This gave his volume. Knowing his weight, he was able to determine his specific gravity which was found to be .89. The question then arose why he could not swim, and it is presumed that the discussion will contribute some additional confidence at the next swimming lesson. The slight difference in weight between fresh water and sea water is noted and the flimsy excuse is removed from those who think they could swim in salt water but cannot in fresh.

GASES. — The second proposition is: (a) *Pressure in gases increases with the depth, but is not proportional to it.* (b) *At any given depth the pressure is equal in all directions.*

The fact that pupils have always lived at the bottom of an ocean of air and have not been conscious of its buoyance, has made them grow up with the feeling that gases as a rule have no weight and cannot exert a pressure. It is therefore necessary not merely to convince them of the fact, but to impress it upon them so that they will feel it to be natural to think of gases as being subject to the attraction of gravity and therefore having weight.

Air is weighed and it is found that one cubic foot of it weighs about an ounce and a quarter. It is therefore calculated that the air in a lecture room whose dimensions are 60x40x20 feet, weighs one and seven-eights of a ton.

Our discussions run about as follows: Contemplate the momentum of countless tons of air moving at a velocity of fifty to a hundred miles an hour. Is it strange that it unroofs buildings, uproots trees, piles high the sand dunes, drifts great snow banks, and raises the sea in huge masses?

The barometer proves the weight of the air and is shown to be only a slight modification of the mercury pressure gauge which we have used for liquid pressures.

The only reason for studying the pressure of gases apart from that of liquids is the fact that gases are compressible while liquids are not, hence proposition two is a review of proposition one with a distinction to be carefully noted. Gases under pressure condense and are like a coiled spring, the outward push of the spring is equal to the pressure upon it, Fig. 4; hence the tension of gases is equal to the pressure upon them. The length of the spring is proportional to the pressure upon it. It is so used in spring balances to determine the magnitude of weights. In the same manner the volume of a gas is proportional to the pressure upon it. This law was the discovery of Robert Boyle in the seventeenth century.

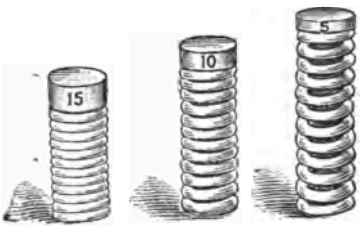

Figure 4.

It must therefore appear that it is gravity which causes a balloon to rise. The balloon floats in the air for the same reason that a block of wood floats on water. We do not say this proves that wood has no weight, but rather it proves that water has weight — hence its buoyancy. The rising balloon likewise testifies to the weight and consequent buoyancy of the air. Air being compressible its density varies with the height; hence we may control the height to which a balloon will rise in the air by throwing out ballast and reducing its weight, or letting out gas and reducing its volume. Not so with the block of wood floating in water. If we weight it until it is submerged, it immediately goes way to the bottom; this proves that the water has uniform density.

Transmission of Pressure through Liquids and Gases. — The third proposition is: *Pressure exerted upon a fluid (liquid or gas) inclosed in a vessel is transmitted equally in all directions, the total pressure upon the walls of the vessel being proportional to the area.* This principle has in a measure been assumed in the study of the two foregoing propositions, which is bad logic, but not necessarily bad pedagogy.

The two pieces of apparatus used for illustrating this principle are represented in Figs. 5 and 6. Mercury is put into the bent tubes (Fig. 5), to serve as a gauge of the pressure. The

mouth of the experimenter is applied to the free end of the tube above at the left; by pinching the rubber tube connection between the first and second pressure gauges, the pressure which he may exert from his lungs is all directed upon the mercury in the first tube. Suppose he finds that this is sufficient to support a column of mercury three inches high, a pressure which he has learned to designate as one and a half pounds per square inch. If now he releases the rubber tube between the first and second gauges and pinches that between the second and third gauges he finds that with an effort equal to that used before he may make each of them register three inches, or one and a half pound pressure per square inch. In the same manner he may exert pressure upon three or any number of pressure gauges simultaneously and find that it is as easy to hold up a hundred columns of mercury as it is to hold up one.

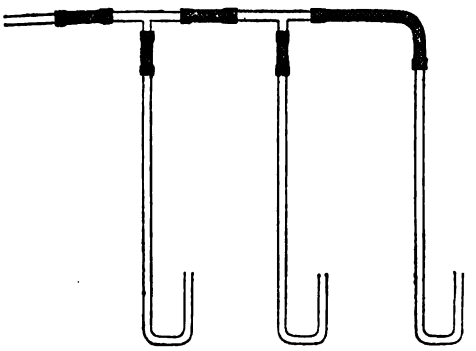

Figure 5.

Figure 6.

The apparatus represented in Fig. 6 is a jelly-cake tin with a rubber cloth tied over the top and a tube inserted into the side. The area of the top is about 80 square inches. A board is laid upon it and weights put upon the board; when the mouth is applied to the tube one has the novel experience of finding that he can lift about 118 pounds by his breath. The hydrostatic press is discussed and it is shown to conform to the laws of machines and thus again the principles of work and the conservation of energy are illustrated.

Having spent about three weeks in the study of the pressure of fluids, arranged under these three propositions, the next two weeks are given to the applications of these principles to siphons, pumps, Cartesian divers, Magdeburg hemispheres, hydraulic elevators, pneumatic cash systems and mailing tubes, door checks,

compressed air motors, air brakes, diving bells, caissons, the ear drum, the physics of respiration, the student's lamp, the fountain ink well and sponge cup, " fountain in vacuo ", Hero's fountain, the specific gravity of milk, cream, whole milk, skimmed milk, and watered milk, etc., etc.

In the laboratory work connected with the pressure in fluids each pupil performs twenty-five or thirty experiments, fully half of which are quantitative, and most of the qualitative experiments have mathematical problems connected with them; for example, in connection with the apparatus illustrated in Fig. 7 the following calculations are called for. In a large wide-mouthed bottle of water a small vial is inserted, having just enough air in the upper part to float it. The weight of the vial is 3.5 grams, the air which it contains is 2.5 cubic centimeters. What must be the volume of glass in it, and what is its specific gravity? The rubber cloth is air-tight over the mouth of the large bottle. If now we exert a pressure of 5 pounds per square inch upon the rubber, what will the volume of the air in the vial become? Will it sink? If so, with how much force will it press upon the bottom of the large bottle? If now we remove the pressure from the rubber cloth, and pull upward upon it with a force of 5 pounds per square inch, what will the volume of the air in the vial become? Will the vial rise above the surface of the water in the large bottle? If so, what volume will emerge?

Figure 7.

HEAT (*Five Weeks*)

How Heat is Produced:

Heat produced by friction. Machinery warms up while running. Oil is used to reduce friction and thereby diminish heat. Machines when mismanaged often get so hot in their bearings as to set fire to the oil used to lubricate them. A good example of this is the " hot box " on the car axle. The friction match is heated to the kindling temperature by scratching it upon a rough surface.

Heat produced by pressure. Substances which contract under pressure yield heat. Hence the heating of the sun and

other heavenly bodies under the weight of their own mass. When the pressure is removed and the mass expands it becomes cold. The manufacture of ice, liquid air, etc.

Heat produced by chemical action. Combustion, the slaking of lime, zinc and sulphuric acid all illustrate this. Compost heaps get very warm by reason of the chemical action that is going on in them. Piles of green grass, new grain, new hay, new flour, cotton with seed in it, and oily cotton waste, all produce heat for the same reason. Animal heat.

Heat from electricity. Resistance to the electric current produces heat. This is sufficient to cook with in the electric stove. Our electric cars are warmed in winter by turning electric energy into heat.

SOME EFFECTS OF HEAT:

Expansion of solids. Setting wagon tires, riveting boiler plates, dial thermometers, iron bridges, lamp chimneys, chemical glassware, thermostatic valves and regulators are taken as illustrations.

Expansion of liquids. Mercury thermometers. The action of water, and such metals as crystallize.

Expansion of gases. Law of Charles. Air thermometer. Heat determines the state of a substance. Fusion. Vaporization. Dew point. Humidity. Relation of pressure to evaporation.

HOW HEAT IS TRANSFERRED:

Conduction. The metals. The use of sawdust in ice houses. The use of double windows on dwelling houses. Clothing. Norwegian cooking box. Brick wall around a furnace. Covering of steam pipes. We are living on a globe with only a thin nonconducting shell between us and the intensely heated interior. Water pipes laid a few feet under ground do not loose their heat sufficiently to freeze. Snow protects vegetables.

Convection. The hot-air furnace. The hot-water heater. Winds. Land and sea breezes. Ocean curents. Ventilation.

Radiation. How we get heat from an open fireplace. Would we be able to receive heat from the fire if there were no atmosphere or matter of any kind in which conduction and convection

could occur? How we get heat from the sun. The hotbed. The green house. Compare the effect of our atmosphere to that of a hotbed. Action of moisture in the air. Upper and lower regions of the air. Conditions upon the moon where no atmosphere exists. Why dew and frost collect more upon some things than upon others. How snow produces hotbed conditions. The ether. Wave motions. Kinds of radiation. Velocity of radiation. Absorption, radiation and reflection. Relation of heat and light. The radiometer.

CALORIMETRY AND SPECIFIC HEAT:

Distinction between temperature and quantity of heat. Compare *pressure* and *quantity* in hydraulics, heat, and electricity. Specific heat. Effects of large bodies of water upon climate. The efficiency of hot water heating apparatus. The hot water tank in the kitchen. Land and sea breezes as related to specific heat.

In the laboratory each pupil has three bright metal cups, two of which contain each 200 grams of water at the temperature of the room, and the third contains 200 grams of water and a piece of lead weighing 200 grams with a thread attached. This third vessel is heated, temperature of contents of all three taken, then the 200 grams of hot lead is transferred to one of the vessels containing 200 grams of cold water and the 200 grams of hot water is poured into the other vessel containing 200 grams of cold water. The resulting temperature is found and sources of error discussed. Some of the pupils who have extra time are set the task of determining the amount of heat lost to the cups.

LATENT HEAT:

Heat disappears when solids liquefy. The temperature of water and of common salt, before and after mixing.

The temperature of shaved ice and common salt, before and after mixing. Ice liquefies faster when mixed with salt than otherwise. Why salt is put upon icy pavements. Freezing mixtures. Why ice and snow are so slow to melt.

Heat disappears when liquids vaporize. Take the temperature of ether in a bottle. Expose it to evaporate in a shallow

dish and take its temperature again. Put a drop of water into it and fan the ether to hasten evaporation. Note that the water freezes.

Ice machines which use ammonia. The water bath. The double boiler. Animal heat reduced by perspiration. Sprinkling with water for the purpose of cooling. "Muggy days." Humidity. Why is it difficult to cook on a mountain top? Freezing produced by reducing the pressure. Making liquid air. Why liquid air is so slow to pass into a gas. The temperature of compressed air motors. Freezing "quicksands" for engineering purposes. The regulation of animal heat.

Heat reappears when vapors liquefy. Steam heating of buildings. Moderation of temperature during rain. Moist air accompanying Gulf Stream.

Heat reappears when liquids solidify. Fuse sodium sulphate crystals. Allow the liquid to cool quietly. Insert a thermometer and note the rise in temperature as the crystals form again. Temperature in centre of a snow storm. Tubs of water put in a cellar to keep vegetables from freezing. Large bodies of water in freezing modify the climate.

In the laboratory each pupil performs about forty experiments, one-quarter of which are quantitative; the others are chiefly qualitative, many of which are intended to parallel larger phenomenon in nature and all of them have for their main purpose the making real of the ideas presented.

MAGNETISM AND ELECTRICITY (*Eight Weeks*)

MAGNETISM:

Lodestone. The making of magnets. Magnetic substances. Lines of force about a magnet. Each molecule a magnet. The earth a magnet. Charts of the lines of force upon the earth. Mariner's compass. Law of inverse squares.

Each pupil performs in the laboratory about eight or ten experiments in magnetism, such as the following:

The apparatus represented in Fig. 8 consists of a glass tube fitted into a cork, containing pieces of soft iron wire, each about one-quarter of an inch long. Find how many bits of iron each pole of a bar magnet will lift and try the power of the magnet

at various points between the poles. Lay a second bar magnet upon the first with like poles together and repeat the experiment. Repeat the experiment, having unlike poles together. Place one pole of a magnet upon the upper end of the glass tube and place the opposite pole of another magnet against the side of the tube an inch or two below the upper end. Try, now, the power of the upper magnet to lift bits of iron. Reverse the poles of the lower magnet and try again.

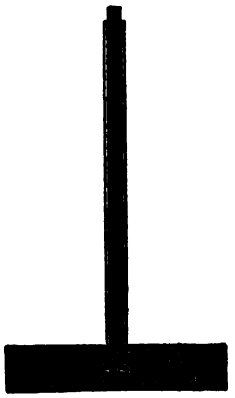

Figure 8.

STATIC ELECTRICITY:

Charges of electricity, how developed, how maintained. Conductors. The influence of electrified bodies upon neighboring objects. Electrophorus. Leyden jar. Distribution of charge. Lightning. Gas-lighting by static machine.

Each pupil performs in the laboratory about ten or twelve experiments in static electricity, such as the following:

Bring an electrified stick of sealing wax underneath a pith ball, *e* (Fig. 9), suspended by a copper wire. Make the sealing wax approach very near to the pith ball, but do not allow it to touch. While holding the sealing wax near to *e*, lift the pith ball, *f*, which is also suspended by a copper wire, off from the copper wire, *b c*, and hang it upon the silk thread, *c d*. A loose piece of silk thread, *g*, is provided, so that this may be done without touching the copper with the fingers. Test now each ball with both glass and sealing wax to determine whether it is positively or negatively electrified.

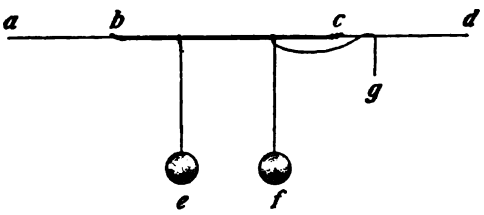

Figure 9.

Hold an electrified stick of sealing wax near to but not touching a pith ball suspended by a silk thread. Touch the pith ball with the finger while it is near the sealing wax. Test now

the pith ball with both glass and sealing wax to determine whether it is positively or negatively electrified.

Can you, by means of an electrified glass tube, charge a pith ball suspended upon a silk thread either positively or negatively at pleasure? Try it.

ELECTRIC CURRENTS:

Sources of electric currents. Electric potential. Relation of static electricity and electric currents. Typical cells. Chemical, heating, and magnetic effects of electric currents. The uses of electromagnets in telegraph sounders, in electric bells, in electric motors, etc. The galvanometer. The ammeter. The voltmeter. Ohms. Volts. Amperes. Electrical measurements. Induction. The telephone. The magneto-electric machine used for telephone calls. The dynamo. Transformers. Thermo-electric generators. The thermopile.

Each student performs in the laboratory about twenty-five or thirty experiments in electric currents of which the following are typical: Examine an electric bell and trace the path of the current through it. Send the current through it so as to make a "single-stroke" bell; a "clatter" bell. Ilustrate by diagrams. Connect your battery with a voltmeter and ammeter in parallel. Add slowly from 0 to 10 ohms resistance to the ammeter circuit. Record the readings of voltmeter and ammeter at each step. Find about what current is required to operate the pieces of apparatus furnished you. (Electric bell, small motor, electrolysis apparatus, etc.) Connect two motors with a rubber band. Operate one with a battery and connect the other with the galvanometer. Is the second motor producing a current as a dynamo? If so, how much and what is its electromotive force? Operate the hand dynamo and see whether it goes harder when its current is made to do work, such as decomposing water, heating a wire, ringing a bell, operating a motor, etc.

LIGHT (*Five Weeks*)

The nature of light. Its velocity. Its sources. Law of inverse squares. Relation between temperature and intensity of light. Visual angle; how it helps us to estimate distances.

Shadows. Eclipses Light through small apertures. Laws of reflection. Images in plain mirrors. Concave mirrors. Enlarged images formed in concave mirrors. Inverted images in concave mirrors. Diminished images in convex mirrors. Curved image from a straight object. How daylight is diffused. Halos about street lights and about the moon. Illumination of clouds at sunset. Moonlight and the phases of the moon. How the dark part of the new moon is made visible. Why transparent objects and good reflectors are themselves invisible. Reading from glazed paper. Twilight. Refraction. Index of refraction. Critical angle. Total reflection. How refraction lengthens the day. Mirage. The brilliancy of precious stones. Refraction of light enables us to see colorless and transparent fluids. Prisms. Lenses. Enlarged images produced by refraction. Inverted images produced by refraction. Focal distances. How a lens forms a picture. Conjugate foci.

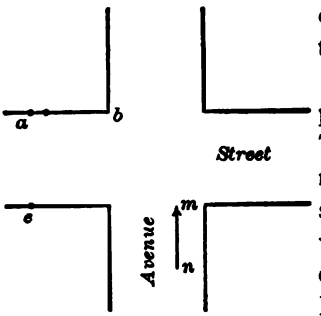

Figure 10.

The simple microscope. Compound microscope. The telescope. The photographic camera. The human eye. Nearsightedness. Farsightedness. The spectrum. The invisible spectrum. Complementary colors. Roentgen rays. Hertz waves. Polarization of light. The identity of the various forms of radiation.

Each pupil performs in the laboratory about twenty exercises in light. Most of them are quantitative. Some of these exercises consist of constructing diagrams to illustrate principles. For example, having developed by means of apparatus the laws of reflection, the pupils are called upon to construct such diagrams as follow:

Suppose you live at *e* (Fig. 10), and across the street at *ab* is a show window which serves as a mirror; *mn* is a street car passing up the avenue. Complete this diagram, showing where the image *mn* will appear to be located, and showing the direction in which the image will appear to be moving. Where must a placard be hung upon the show window to hide the point *n* from your vision.

Suppose *cc'c''* (Fig. 11) is a curved mirror, the centre of whose

curvature is *d* and that *mn* is an object before the mirror and that *e* is the eye of an observer. Complete the diagram, making it show the position of the image *m'o'p'n'*, its shape and its size; also the angles of incidence and reflection for each of the four rays. Measure these angles with your protractor to determine whether the figure is correct. Test the truth of your conclusion by holding the curved mirror before your face and bringing a small object, *mn*, between your face and the mirror.

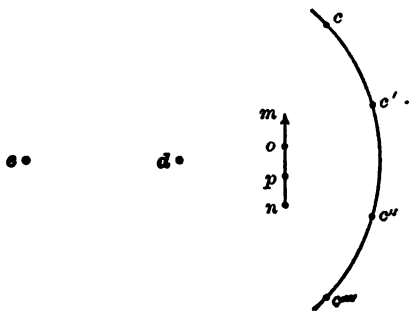

Figure 11.

Let *mn* (Fig. 12) represent a vertical line across your face, *e* the position of your eye, *ab* the mirror, *d* the centre of its curve. Complete the diagram, showing by lines, the courses which rays of light from *m* and *n* must take in order to reach the eye by reflection from the mirror, showing also the position and relative size of the image *m'n'*. Test the angles of incidence and reflection with your protractor.

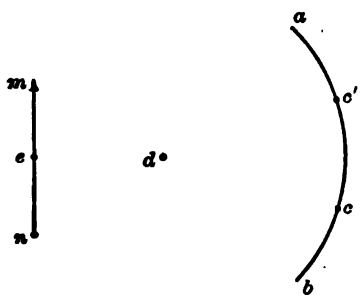

Figure 12.

SOUND (*Three Weeks*)

Sources. Transmission. Loudness. Pitch. Quality. Reflection, echoes. Velocity. Vibration of strings. Sympathetic vibration. Music. The scale. Melody. Chords. Harmony. Counterpoint. The voice. The ear. The phonograph. The telephone.

Each pupil performs in the laboratory about fifteen exercises in sound, most of which are qualitative.

It will occur to those who read over this syllabus of work in physics that there is too much of it to be done satisfactorily. We find this to be true. The amount which we actually accomplish differs considerably from year to year. The ground of the foregoing syllabus has all been gone over in our high-school classes, but never all of it with any one class. Probably as much as one-tenth of it will be omitted this present year, and a good deal of the rest will be very much slighted. But we find our tendency is to get in a little more each year by connecting the parts better. Ideas which had been presented in an isolated fashion are brought in under some common head and by serving as further illustrations of the same thing serve not to increase the labor, but to make clearer and easier that which would have been rather obscure and difficult. By this means alone we have come to teach the subject of pressure in fluids in half the time which we once required, and at the same time we treat it more completely than formerly.

Incidentally we are bringing in more of the history of chemistry and physics each year and more of the biography of the masters. The pupils are buying for their own libraries more books related to the subject of chemistry and physics each year and the number of them who have private laboratories at home is increasing each year.

EXCURSIONS

An essential feature of our work in physics and chemistry is the pursuit of these subjects outside of the lecture, the recitation and the laboratory into the daily life. For this purpose we attempt so far as practicable excursions. In New York City, high-school pupils have so many home engagements that it is not possible to get a large portion of any class to go on excursions out of school hours, and it is not possible to take them away from the building on excursions during the school hours, because of their engagements with the other teachers. We do however arrange a few excursions within the city limits for such as can go to gas factory; sulphuric acid factory; soap factory; mineral water factory; candy factory; glass, china, pottery, lime, mortar and cement works; ice factory; water works; boiler works; machine shops, power houses, etc. From such excursions taken by comparatively small groups, reports are given to the whole class. But fortunately we have within our own buildings a plant which furnishes admirable opportunity for studying physics and chemistry in a very practical way. This we can visit during the regular laboratory periods, using the lecture and recitation periods for discussion and for demonstration with models and charts. The following outline will serve to indicate the nature of this work. Classes from the elementary school are also taken upon excursions about the buildings, and lessons suited to their needs are selected from the following outline:

Facts Brought Out by Excursions about the Building

Cost of plant for heating, lighting and ventilating Teachers College, about $100,000, and for Horace Mann School about $45,000 in addition.

Where our coal comes from. Its formation. How transported.

Hard and soft coal. Chemical constitution.

Our coal vaults hold about 240 tons — one boat load.

Consumption approximately as follows:

September	50	tons
October	150	"
November	200	"
December	250	"
January	300	"
February	300	"
March	250	"
April	200	"
May	150	"
June	50	"
	1900	"

Approximate cost, $6,500.

What constitutes good coal. Use and relative cost of various sizes.

What constitutes good firing. Chemistry and physics of the process.

Possible temperature of the fire.

Duties of fireman.

Duties of coal passer.

Proportion of *ash* in coal.

Proportion of *ashes* in coal.

Why the distinction is made.

Ash cars and elevator. Reason for such an equipment.

Capacity of ash elevator 2,000 lbs.

Capacity of car 600 or 700 lbs. About three ash-car loads fill a street ash cart.

Dumping the ash cars. The ash chute.

What the street cleaning department does with the ashes.

Construction of boilers.

Allowance made for the expansion of grate bars.

Area of grates 27 square feet for one of the 136 horse-power boilers, or 1 square foot of grate for five horse power.

Allowance for expansion and contraction in boiler tubes.

Capacity of boilers:

No. 1	157	horse	power
No. 2	136	"	"
No. 3	136	"	"
No. 4	136	"	"
No. 5	136	"	"
	701	"	"

Square feet of heating surface, 7,700=11 square feet for each horse power.

In process of construction:

No. 6	209	horse power
No. 7	209	" "
No. 8	209	" "
	627	" "

Our five furnaces consume about 1 ton (2,240 lbs.) of coal per hour when doing their best work. It is estimated that under those conditions they generate 700 horse power. Hence 3.21 lbs. coal=one horse power per hour. One horse power= 33,000 foot pounds. 772 foot pounds=one British thermal unit. One B. T. U.=amount of heat necessary to raise 1 lb. of water at maximum density 1° F. One horse power= 42.75 B. T. U. It is estimated that our boilers evaporate 30 lbs. of water for each horse power hour; that is, 1 lb. of coal evaporates about 9 lbs. of water, or more exactly, 9.375 lbs. at the pressure of 90 lbs. per square inch which we maintain. Calculate the number of thermal units required to evaporate that amount of water under the conditions which obtain.

The number of thermal units which may be produced by burning 1 lb. of our coal in our furnaces may be estimated at 14,000.

Suggest ways to account for the loss of heat.

Boiler inspections by Police and Insurance Company.

Insurance (Board of Fire Underwriters).

Method of testing boilers.

Causes of boiler explosions.

Cleaning boilers — Corrosion and incrustation.

Effect upon amount of fuel used and protection of pipes from over-heating.

Filtered water.

Exclusion of cylinder oil.

Amount of water lost from the system each day.

Trace products of combustion to chimney.

Possible products and significance.

Possible temperature of gases in the chimney. Height of chimney 100 feet and diameter 75 inches. Cause of draught.

Automatic damper control.

Water gauge on boilers.

Steam gauge on boilers. Show mechanism. Self-recording gauge in engineer's room.
Pressure maintained at 90 lbs. per square inch.
Boiling temperature of water under that pressure.
One cubic foot of water will expand into about how many cubic feet of steam at the pressure maintained in our mains (90 lbs. at gauge, 105 lbs. absolute.)
Return pumps and drip tanks.
Importance of keeping constant supply of water in boilers.
Method of emptying pits under drip tanks by "blow off siphon."
Trace steam mains to reducing valve.
Non-conducting coverings of steam pipes.
Use of angles in main.
Mechanism of reducing valve.
After passing through the reducing valve the pressure maintained by the pump of our Webster system is 10 lbs. less than the atmospheric pressure=5 lbs. absolute pressure. Under these conditions it will require about how many cubic feet of steam to produce 1 cubic foot of water in the return pipes?
Vacuum gauge.

LOW PRESSURE STEAM SYSTEM:

Indirect Heating System. Total volume of air supplied. Total volume of air in rooms.
Cold-air inlets. Stacks of steam pipes. Inlet fans and engine. Three at Teachers College operated by steam and two at Horace Mann School operated by electricity. Thermometer. What temperature maintained. Supply ducts. Inlet registers with red cords — ducts. Outlet fans and motors — seven in number at Teachers College and two at Horace Mann School — in garret. Cupolas and shutters.
Diagrams of the system in Teachers College and Horace Mann School. Use of anemometer to determine efficiency of ventilation.
Methods of testing purity of air.
Results found in Teachers College and Horace Mann School.
Dryness of air in buildings, cf. desert climate. Humidostat.

Effect of extreme dryness in winter and moisture in summer upon our woodwork and furniture. Method of protecting wood from such effects.

Direct Heating System. Risers. Radiators — form and construction — thermostatic outlet valve. Return pipes — tank-pump-boiler.

Latent heat of steam. Radiation of heat not dependent upon circulation of air. Heat distributed from the steam radiators, both by convection and by radiation.

Small capacity of dry air for heat. Effects of moisture in the air upon its capacity for heat.

Webster system.

Automatic return pumps and automatic pumps for Webster system.

Steam traps.

SYSTEM OF TEMPERATURE REGULATION:

Thermostats and thermostatic valves. Thermostatic pumps to control both indirect and direct systems.

Methods of heating, without ventilating, building in early morning before pupils arrive and in afternoon when only few are in the offices of the building.

HIGH PRESSURE STEAM SYSTEM:

Engineer's examinations.

Duties of engineer and assistant.

Steam engines for fans and dynamos — capacity.

Steam pumps — capacity.

Supply steam. Cylinder. Piston and piston rod. Valves for admission and escape of steam in cylinder.

Fly wheel and driving pulley. Governor. Exhaust steam.

Cylinder oils and engine oils.

Characteristics, — amount used, — cost.

HYDRAULIC ELEVATORS:

Elevator pumps. Pressure tank. Reservoir.

Cylinder, piston, valves, pulleys and cables.

Car, electric call bells, electric lights, gas lights.

WATER SYSTEM:

Croton pressure. Source and cause of variation. Water meters. Amount of water used in buildings. Cost.
Filter. Contents of bed. How kept clean. Capacity 50,000 gal. (=7,000 cu. ft.) a day.
House pump. Tanks in garret.
Electric signal for full and empty tank.
"Tank pressure." Uses of water about the building.
Floating stop cocks. Siphon discharges. Hot and cold water. How heated.
Automatic arrangements. Temperature regulating valves for shower baths in gymnasium.
Waste pipes. Traps. "Back air" pipes.

OIL FILTER.

ILLUMINATING GAS:

Its manufacture.
Gas meter. Amount used in buildings. Cost.

DYNAMOS:

No. 1 55 kilowatt, speed 280 r.p.m. 480 amp. at 115 volts
" 2 150 " " 230 " 1280 " " 115 "
1760
" 3 in process of construction.
" 4 in future.

Direct — connected with engines, multipolar; field, armatures, commutators.
Switch board — automatic cut out — busbars — rheostat.
Capacity of switches — fuses.
Voltmeter — construction.
Ammeter — construction.
Tactometer for determining number of revolutions per minute.
Capacity of various conductors — insulation.

ELECTRIC LIGHTING:

3	arc lights			= 15	amp.
8	arc-light stereopticons			= 80	"
208	incandescent lights,	east wing		= 104	"
437	"	"	south "	= 218½	"
391	"	"	west "	= 195½	"
541	"	"	north "	= 270½	"
866	"	"	Horace Mann school	= 433	"
				1316½	"

ELECTRIC HEATING:

Electric oven . . . . . = 13 amp.

ELECTRIC POWER:

One watt=1 ampere per second at 1 volt.

One horse power=746 watts=about 7 amperes under the average voltage at the various machines in these buildings.

One kilowatt=1000 watts.

Wattmeter.

MOTORS:

1–25	horse power,	repair shop		= 175	amp.
1–10	"	"	machine tool room	= 70	"
1–10	"	"	wood turning room	= 70	"
7– 3	"	"	attic fans	= 150	"
1– ½	"	"	organ motor	= 3½	"
2–22	"	"	basement fans, Horace Mann school	= 300	"
2–11	"	"	attic fans, Horace Mann school	= 150	"
1–28	"	"	elevator, Horace Mann school	= 200	"
				1118½	"

Total amount required to operate entire plant=2448 amperes.

Capacity of generators=1760 amperes.

Electric elevator — mechanism.

CLOCKS:

Self-winding by electric batteries and synchronized hourly by Master clock.

In Teachers College	75
In Horace Mann school	55
	130 clocks.

Mechanism and connections.

TELEPHONES:

Long distance system — private exchange. Switch-board cabinet. Two trunk lines — No. 1222 and 1223 Harlem. Seven stations in Teachers College and three in Horace Mann School — ten stations.

Interior telephone system — switch board — six trunk lines. 65 stations in Teachers College and 10 in Horace Mann School — 75 stations. Perfect intercommunication among stations on four of the trunk-line systems without the interposition of *Central*.

Mechanism of receivers, transmitters, annunciators, etc., etc.

The lecture room and laboratories are well supplied with dissected models of many of the machines. There is also a good supply of charts, diagrams, photographs and lantern slides for illustrating the machinery of our plant.

DEPARTMENTAL NOTES

PHYSICAL EDUCATION

The new building which the recent gift of $250,000 to Teachers College makes possible, will provide facilities for several very important phases of educational work, and the institution will have one of the finest of the buildings devoted to the interests of health. It is remarkable, but quite in keeping with the history of the College, that the need which Dean Russell emphasized in his last report for an adequate equipment for the training of school hygienists and teachers of physical education, should be filled so quickly through the munificence of an anonymous donor. It is a striking evidence of the appreciation of this neglected side of education on the part of some generous friend of the College.

This new building will be unique in several respects. It will provide several gymnastic halls and rooms for games and special forms of exercise, so that a large number of people of different ages and both sexes may be engaged in healthful exercise at one time. These unusual facilities for exercise and play are particularly important where the opportunities for outdoor recreation and exercise are so limited as they are in a great city like New York. The building will provide much needed opportunity for general and special forms of exercise for pupils of the Horace Mann Schools, women students of Teachers College, and instructors of both these institutions. It may also be used by Barnard students and women graduate students of the University. The court behind the building will have a swimming pool, covered by a skylight. The basement will contain bowling alleys and handball courts. On the first floor will be the offices for general medical consultation, the offices of the department, and rooms for physical measurements and examinations. Another room will

provide for the special examination of the eyes. There will also be a study and class room for the special students of the department.

On the second floor there will be three large exercise rooms to be used by the elementary pupils of the Horace Mann School in the morning, and by older students in the afternoon. This floor will also have a class room and offices for one or two instructors. The third floor will be the main dressing room floor, and will have lockers and showers, and separate rooms for students and instructors. Smaller rooms will be equipped for corrective gymnastic work to meet the needs of those who require individual care.

On the fourth floor will be the main gymnasium, a large, airy, light hall, with running gallery, and apparatus of various kinds. One end of this floor will be divided into two stories, and here will be found instructors' offices and rooms for photography, spaces for such exercises as fencing, and one or two rooms for games of different kinds. In various parts of the building there will be rooms which can be used for laboratory purposes. These will provide facilities for the investigation of the effects of different kinds of exercise, and other problems of physical education and school hygiene.

The gymnasium will not be equipped with the apparatus of any particular system of physical training, but the best appliances from various sources will be grouped so as to provide the most favorable conditions for the work which is to be done.

The fact of greater significance, from an educational standpoint, is the remarkable completeness of the material equipment which the College will have for the training of specialists in physical education. There will be lecture rooms, laboratories, exercise halls, and in short, provision for both the theoretical and practical sides of the course of instruction. The student will also have unusual opportunities for observing the different kinds of practical work done in this field.

There is a large demand to-day for teachers and supervisors of physical education and school hygiene who have been broadly and thoroughly trained and who stand in all respects on a par with teachers of other branches. Special teachers in this line have in most cases lacked adequate general education, and have been trained too narrowly, and without sufficient knowledge of

the relation of their own to other subjects, or to education in general. This new building and its equipment, with the extraordinary advantages afforded by the College, the University, and New York City, will provide unequalled facilities for the training of special teachers.

It is proposed to establish a professional course in physical education leading to the Bachelor's diploma, similar in plan and requirements to the professional courses in other departments. An outline of some of the courses planned for this diploma will be found in the new Announcement of the College. With this definite provision of a workshop for the department, it will be possible for students who wish to specialize in physical education to shape their work so as to begin the two years' professional course in October, 1903. T. D. W.

GEOGRAPHY

The College Entrance Requirement in Geography. — A comparison of the Secondary Course of Study in Geography in the Horace Mann School, as outlined in the RECORD, Vol. II, March, 1901, pp. 74-104, with the recently published outline of Requirements in Geography of the College Entrance Examination Board, in Document No. 8, January 10, 1902, pp. 35-40, will show an essential similarity of plan. In fact, the course in the Horace Mann School was outlined to meet the requirements for College Entrance as they had at that time already been advocated by the sub-committee on Geography of the Committee on College Entrance Requirements of the National Educational Association.

The course in the Horace Mann School covers the ground in a somewhat different order of larger topics, but the course can be easily rearranged to meet the needs of teachers.

It will be noted on a comparison of the two publications that certain topics are treated in the Course of Study much more fully than the Examination Board outline would imply as a necessity. Among such topics that may if necessary be abridged for College Entrance preparation are those under the atmosphere — rainfall and climate; under the ocean — the formation of shore lines; under land — map projection, coastal plains, old plains of erosion, embayed mountains, work of underground waters, work of

glaciers. The summary in reference to earth and man can also be largely omitted, the details being introduced as they need to be in the progress of lessons on the physical topics.

The list of possible exercises published by the College Entrance Board, is a valuable adjunct to the Course of Study, inasmuch as it provides a means of valuation for the laboratory exercises published in the Course of Study. Any well trained teacher should find the Course of Study of the Horace Mann School easily applicable to the needs of college entrance requirement, though care should be taken in choosing the topics to be emphasized to select those that will best round out the text used as guide, or for collateral reading.

New Quarters for Department. — The Department is now adequately housed in a series of rooms in the east wing of the second floor of the college building. On the east side are the offices of the head of the Department, and a laboratory with table accommodation for fifty students. This room also has a northern exposure, thus allowing a window shelter for meteorological students. Adjoining this room, and with an exposure to the north and west is a lecture room, with seats for fifty students, and fitted with electric lantern, maps, models, etc., for lecture use. The remaining rooms, with an opening on the central court of the building, are an office for the tutor in the Department, and a large stock and work room for the storage of maps, models, and other geographical appliances. Thus the accommodations are ample for both graduate and undergraduate work.

Professor Dodge, head of the Department of Geography, is Chairman of the Committee of Seven appointed in December, 1901, by the New York State Science Teachers' Association, to prepare a course of study in secondary school geography. The committee made a preliminary report at the meeting of the Association in December, 1901, and presented a tentative course of study that will be printed in full in the report of the Association meeting to be published as a Bulletin by the Regents of the University of the State of New York.

The Committee was continued for one year, to prepare a series of laboratory exercises for secondary school work, and also to prepare a course of study for elementary schools.

The Journal of School Geography, which had been edited for five years by the head of the Department of Geography, was

merged, beginning in January, 1902, with the *Bulletin of the American Bureau of Geography,* which had been issued by Professor Lehnerts, of the State Normal School, Winona, Minn., for two years. The successor to these two periodicals is known as the *Journal of Geography,* and will be edited by Professors Lehnerts and Dodge and Dr. J. Paul Goode, Instructor in Geography in the University of Pennsylvania. The board of editors have as assistants a goodly number of associate editors, chosen from among the scientific geographers and leading geography teachers of the country. The new *Journal,* like its predecessors, will be devoted to the advancement of geographic education.

R. E. D.

BIOLOGY

The outline of the Course in Botany, given in the Horace Mann School, as published in the TEACHERS COLLEGE RECORD, Vol. II, No. 1, agrees very closely to the standard entrance option in botany adopted by the College Entrance Examination Board as far as the topics and amount of work is concerned. The Horace Mann outline, however, embodies in addition the doctrine that there should be given first a synthetic course on the structure and physiology of plants, followed by a study of types.

The treatment of the subject of Ecology, which in the entrance option is outlined separately from the remainder, is planned for in the Horace Mann outline in connection with other topics. This, of course, is what is contemplated by the Entrance Board.

The Department of Biology in Teachers College may now be said to be fairly well equipped. There is, first of all, a sufficient amount of floor space for comfort for the number of students at present in attendance.

There are two laboratories, one of which accommodates very comfortably thirty students at one time, all of whom have a good amount of space and of light in which to work. The same room serves as a lecture room, there being a semi-circle of chairs for the accommodation of thirty students. A steel aquarium rack and a fair-sized conservatory provide for the reception of such animals and plants as are in use for study.

A smaller laboratory can be made to hold twenty-four students engaged in laboratory work.

In addition to the two laboratories there are two stock rooms, one for glass ware, chemicals, and the like, the other for plant and animal materials for class use. A third stock room of good size serving for the storage of materials in large amounts, large aquaria, and wares of various kinds, completes the suite of available space for the magazine.

There is also a very good dark room for photography, and one for physiological experimentation, in which the temperature is fairly constant, and into which no light at all can enter.

Two small offices for the use of the instructors complete the suite of rooms, of which the lighting, an important feature, is excellent, since the exposure is chiefly north and partly east.

The equipment has been increased this year by the purchase of the Leuckart zoölogical and Kny botanical charts, and by the building up of demonstration preparations of the anatomy, morphology, and embryology of animals and plant types.

The following studies are in progress:

Professor Lloyd: On the embryology of the Rubiacæ, viviparity in Podocarpus, and other minor problems.

Dr. Bigelow: On the embryology of Balanus.

F. E. L.

PICTURES FOR NATURE STUDY

By LOUISE CLARK

Student in Teachers College; Principal-elect of the Primary Department and Teacher of Primary Methods in State Normal School, Potsdam, N. Y.

LIST OF ABBREVIATIONS

A.	*Animals from Life,* Rand, McNally & Co., Chicago.
A. M. J.	*American Museum Journal,* American Museum of Natural History, N. Y.
Au.	The Autotype Co., 74 New Oxford St., London.
B.	George P. Brown & Co., Beverly, Mass.
B. I.	Brown one-cent prints (5½ x 8); 55 for 50 cts., 120 for $1.
Ber.	Berlin Photographic Co., 14 E. 23d St., N. Y.
Braun	Braun, Clement & Co., 249 Fifth Ave., N. Y.
Busse	George Busse, 12 W. 28th St., N. Y.
C.	Copley prints, Curtis and Cameron, Pierce Bldg., Boston.
C. L.	*Country Life in America,* Doubleday, Page & Co., N. Y.
C. Mag.	*Century Magazine,* Century Co., N. Y.
Cosmos	Cosmos Picture Co., 296 Broadway, N. Y.
D.	Detroit Photographic Co., Detroit, Mich.
D. of A.	Department of Agriculture, Washington, D. C.
E.	A. W. Elson & Co., Boston.
E. A.	Elson carbon photographs, 30 x 44, $10.
E. B.	Elson, 27½ x 34½, $5.
E. C.	Elson, 20 x 25, $3.
E. D.	Elson, 16 x 20, $1.50.
E. F.	Elson, 13 x 19, $1.50.
E. R.	Elson, 19 x 25, $3.
E. I.	Elson, 28 x 35, $4.
E. II.	Elson cardboard mats, $15.
E. III.	Elson, 21 x 27½, $4.
E. IV.	Elson: Old Masters, 21 x 27½, $2; Modern Masters, 15¾ x 21½, $1.50.
Eth.	Bureau of Ethnology, Smithsonian Institute, Washington, D. C.

E. E.	Etchings and Engravings, Frederick Keppel & Co., 24 Van Buren St., Chicago.
E. Mag. . . .	*Everybody's Magazine,* Wanamaker & Co., N. Y.
F.	Foster Brothers, 3 Park Square, Boston.
H.	Harper, Helmer-Taylor and Soderholtz prints, J. R. Lynch, 257 Fifth Ave., N. Y.
H. 1.	Harper, one-cent pictures.
Hanf.	Franz Hanfstaengl, 114 Fifth Ave., N. Y.
Hanf. R. . . .	Carbon, or photogravure, 23 x 29, $3.
Hanf. I. . . .	Carbon, 29 x 36, $3.
Hanf. F. . . .	Carbon and photogravure, 15 x 20, $1.
Hanf. C. . . .	Carbon (silver prints), 4 x 5, 30 cts.
I. S.	*International Studio,* John Lane, Publishers, N. Y.
L.	The London Art Co., 1624 Chestnut St., Philadelphia.
L. M.	*Ledger Monthly,* Philadelphia.
M.	A. W. Mumford, 203 Michigan Ave., Chicago.
M. 2.	Mumford two-cent pictures.
M. Mag. . . .	*Metropolitan Magazine,* N. Y.
Mc.	*McClure's Magazine,* S. S. McClure Co., N. Y.
N. E.	*New England Magazine,* American Co., N. Y. and Boston.
N. S.	*National Sportsman.*
O.	J. F. Olsson & Co., Cambridge, Mass.
Out.	*Outing Magazine,* Outing Pub. Co., N. Y.
P.	The Perry Picture Co., Malden, Mass., and 76 Fifth Ave., N. Y.
P. 1.	Perry one-cent pictures (5½ x 8); 120 for $1.
P. ½.	Perry one-half cent pictures; for fifty or more.
P. 2.	Perry two-cent pictures, 7 x 9, colored. (No orders for less than 25 cts.)
P. 5.	Perry five-cent pictures, 10 x 12.
Prang	The Prang Educational Co., 3 W. 18th St., N. Y.
P. I.	*Pratt Institute Monthly,* Pratt Institute, Brooklyn.
P. Rep.	Photo Reproduction Co., Chicago.
R.	F. A. Reinehart, Photographer, 1522 Douglas Ave., Omaha, Neb.
S.	E. Steiger & Co., 25 Park Place, N. Y.
S. I.	Smithsonian Institute Report, Washington, D. C.
Scribner . . .	Seton-Thompson pictures, Charles Scribner & Co., N. Y.
Soule	Soule Art Co., 338 Washington Street, Boston.
T. P.	The Tabor-Prang Co., Springfield, Mass.
T.	Earl Thompson & Co., Syracuse, N. Y.
T. B.	Thompson blue prints: 4 x 5, $1 per hundred; 8 x 10, 10 cts. each; 16 x 20, 20 cts. each.
T. S.	Silver prints: 4 x 5, 10 cts.; 8 x 10, 25 cts.; 16 x 20, $1.
T. P.	Platinum prints: 4 x 5, 25 cts.; 8 x 10, 50 cts.; 16 x 20, $2.

W. . . . . The J. C. Witter Co., 26 W. 33d St., N. Y.
W. Photo. . . Witter, 20 x 25, 25-ct. photo prints.
Wil. . . . . Mrs. Lucy Wilson's books (2 vols.) on Picture Study in the Elementary School will be referred to many times. It is published by the Macmillan Co., New York. 90 cts. each.
Woodbury . . Woodbury reproductions, E. & J. B. Young & Co., 9 W. 18th St., N. Y.

I. Animal Life

1. DOMESTICATED ANIMALS

A. Camels

SUBJECT	ARTIST	PUBLISHER
Camel		P. 1.
Camel Running		H. 1.
Camel Loaded		H. 1.
Camel on the Desert		H. 1.

B. Cats

A Fascinating Tale	Ronner	Wil. II.
Left Outside	Richter	W. Photo.
Four Kittens	Adam	P. 1, 5, ½; B. 1; Cosmos.
Kittens	Berger	Hanf. C. & F.
The Cat Family	Adams	P. 1, ½; B. 1; Hanf. C. & F.; Soule Sepia Carbon 20 x 24, $5; Wil. I.
A Study of Cats	Lambert	B. 1; P. 1, ½; Prang 5.
To the Right into Line	Lambert	B. 1.
Old Woman and Cats	Knaus	P. 1.
Cats and Kittens		P. 1, ½.
Four Little Scamps	Adam	H. Carbonettes, 4 x 5; P. 1, 5; Cosmos.
The First Move	Henrietta Ronner	Braun, 14 x 18, $4; 8 x 10, $1.50.
Exact Time	Henrietta Ronner	Braun, 11 x 18, $4; 8 x 10, $1.50.

Platinum Prints of cats, copyrighted by Byerbulard, can be obtained from various Art Stores.

A large number of pictures of cats and kittens can be obtained in the P. 1 and Au. 40 ct. prints.

C. Cattle

SUBJECT	ARTIST	PUBLISHER
Cows at Watering Place	Auguste Bonheur	B. 1; T. B.; T. S.; T. P.
Study of Cows	Barillot	B. 1.
Cattle	Paul Potter	P. 1; B. 1; T. B.; T. S.; T. P.
The Prize Calf	Landseer	B. 1; P. 1.
The Return to the Farm	Troyon	P. 1; B. 1; Cosmos.
Cattle in a Marsh	Von Marcke	B. 1; T. 10 x 13, $2.50; Wil. I.
Landais Cattle	Von Marcke	B. 1.
Portrait with Head of Bull	Rosa Bonheur	B. 1.
In the Open Country	Dupré	Wil. I.
Weaning the Calves	Rosa Bonheur	P. 1, 5; Cosmos.
Landscape with Cattle	Albert Cuyp	Hanf. C. & F. & R.
Oxen Going to Their Work	Troyon	Wil. I.; B. 1; P. 1, 5; Prang 5; W. Carbon 25 x 36, $15.
The Farm Yard	Roll	B. 1; Wil. II.
Autumn Oats	Inness	W. Photo.
Plowing in Nivernais	Rosa Bonheur	B. 1; P. 1; Wil. II.; Braun, 14 x 18, $4; 8 x 10, $1.50; E. II, III & IV; Au. 28 x 35, $10.
The Young Bull	Paul Potter	T. B.; T. S.; T. P.; Wil. I; E. F.; E. R.; E. I.; B 1; P. 1; Hanf. C. F., R. I.
Wild Cattle at Chillingham	Landseer	B. 1.; P. 1; E. 28 x 38, $5.
Scotch Cattle	Wm. Watson	W. Photo Prints, 25 cts.; E. 30 x 40, $2.25.
Cows at the Lake	Voltz	Hanf. C., R. & I.
Home-going Cattle	A. Braithe	Hanf. C. F., R. & I.
Cows and Pigs	Paul Potter	Hanf. C. F. & R.
The Watering-Place	Bertram Priestman.	*I. S.*, July, 1900.
Country with Cattle	Paul Potter	Hanf. C. F. & R.
Resting Cattle	Paul Potter	Hanf. R.; T. B.; T. S.; T. P.
Homeward	Arnesby Brown	*I. S.*, Oct., 1900.
A Dutch Study	Mauve	F., $1.
Road to the Village	Riecke	Soule.
Jersey Cow		H. 1; Cosmos.

SUBJECT	ARTIST	PUBLISHER
"The Runaway" . .	. . . . .	H. 1; Cosmos.
The White Cow . . .	Jules Dupré . . .	T. B.; T. S.; T. P.; Braun, 14 x 18, $4; 8 x 10, $1.50.
Landscape with Cattle .	Thompson . . .	C. 9 x 12, $3; 7 x 9, $1.50.
Resting Cattle . . .	Johnson	C. 6 x 13, $2.50.
Team of Oxen . . .	Rosa Bonheur . .	H. 28 x 35 $4; Braun, 8 x 10, $1.50.
The Prairie	Julien Dupré . . .	Braun.
The Valley of Arques .	Julien Dupré . . .	Braun.
Return from the Field .	Ed. Debat-Pousan .	Braun.
The Drinking Pool . .	Ed. Debat-Pousan .	Braun.
Milking Time . . .	. . . . .	Cosmos.
Brittany Cattle . . .	Rosa Bonheur . .	Cosmos.
Weaning the Calves .	Rosa Bonheur . .	Cosmos.
Oxen Going to Labor .	. . . . .	Cosmos.
Holland Cattle . . .	. . . . .	Cosmos.
The Bull	. . . . .	Cosmos.

D. Dogs

Hounds in Leash . . .	Brenton	Wil. I; Cosmos.
Dignity and Impudence	Landseer	Hanf. R.; B. 1; P. 1; E., 24 x 29, $3; Cosmos; T. B.; T. S.; T. P.; Braun, 14 x 18, $4; Woodbury.
My Dog	Landseer	P. 1; B. 1.
Saved	Landseer	P. 1; B. 1; Cosmos.
Sleeping Bloodhound .	Landseer	Braun, 14 x 18, $4; B. 1; P. 1.
St. Bernard Dog . . .	. . . . .	P. 1.
A Scratch Pack . . .	Barber	B. 1.
Dog	. . . . .	S.
Bayard	F. Paton	B. 1.
Eclipse (head) . . .	F. Paton	B. 1.
Waiting for Breakfast .	Schmitzberger . .	B. 1.
A Day with the Oakley .	Thomas Blinks . .	Ber. Photographs, 26 x 33½, $4; 15 x 20, $1; Photogravures, 13 x 21, $5.
King Charles' Spaniels .	Landseer	H. 1; Braun, 14 x 18, $4.
A Wolf-Dog	Paul Potter . . .	Cosmos; Braun, 14 x 18, $4.
Highland Dogs . . .	Landseer	Woodbury.

E. Goat

SUBJECT	ARTIST	PUBLISHER
Goat		S.
Mountain Goat		Scribner.
Angora Goat		D. of A. Bul. 27.

F. Horses

A Kabyl	Schreyer	Wil. I; Prang 5; B. 1; P. 1.
The Horse Fair	Rosa Bonheur	Wil. II; P. 1, 5, ½; B. 1; E., 26 x 42, $12; Prang 5; Hanf. R. & I.; W. Au.; Carbon Photo, 28 x 28, $5; 22 x 28, $2.25; T. B., S. & P.; Cosmos.
The Watering-Trough	Dagnan-Bouveret	Cosmos; Wil. II; B. 1; P. 1; Prang 5; W. Photo.
Shoeing a Bay Mare	Landseer	B. 1; P. 1; Hanf. R.; E. R.; E. I.
A Distinguished Member of the Humane Society	Landseer	E. I.; E. F.; Hanf. R.
Pharaoh's Horses	J. F. Herring	P. 1, ½; *N. S.*, March, 1901; W. Photo; E., 30 x 30, $2.25; B. 1; T. P.; T. S.; T. P.
Waiting for Mistress	Landseer	*N. S.*, March, 1901.
Coming from the Fair	Rosa Bonheur	P. 1; B. 1; Cosmos.
Three Members of a Temperance Society	Herring	*N. S.*, March, 1901; B. 1; Cosmos.
Resting Horses	L. Hartman	Hanf. C. F. & R.
Labourers	Arnesby Brown	*I. S.*, Oct., 1900.
Wood Cutters	Anton Mauve	F., $1.
The Arabian Chargers	Schreyer	C., 16 x 20, $6; 8 x 13, $3; 6 x 9, $1.50; Cosmos.
In the Normandy	Jules Jacques Veyrasset	Braun, 14 x 18, $4; 8 x 10, $1.50.
Percheron Horses	Jean Richard Gombie	Braun, 14 x 18, $4; 8 x 10, $1.50.
On the Borders of the Marsh	George Maroniez	Braun, 14 x 18, $4.
Horse		S.; *C. L.*, Dec., 1901.

G. Sheep

SUBJECT	ARTIST	PUBLISHER
Sheep	Mauve	W. Platinums, 8 x 10, 75 cts.; 10 x 13, $1.75; P. 1, 5.
Art Critics	O. Gebler	B. 1; Ber., $1, $4.
The Sheep Fold	Charles Jacque	W. Platinum, 9 x 14, $1.50; Wil. II; B. 1; P. 1, ½; E., 33 x 43, $5.
Shepherdess	Le Rolle	B. 1; Wil.; P. 1, 5; Prang 5; W. Carbon, 28 x 38, $5; 22 x 28, $2.25; W., 25 cts.; Photo Prints, 20 x 25; H. 1.
Sheep Autumn	Mauve	P. ½, 1; F., $1; Cosmos.
Sheep Spring	Mauve	P. ½, 1; F., $1; Cosmos.
Brittany Sheep	Rosa Bonheur	W. Photo; Wil. I; B. 1; P. 1; Cosmos; H., 28 x 35, $4.
The Contented Flock		Cosmos.
Landscape with Sheep	Charles Jacque	L., 7½ x 9½, $2; 10 x 13, $3.
Lost	Schenck	F.; W. Photo.
Sheep Shearing	Millet	B. 1; P. 1.
Sheep in Pasture	Auguste Bonheur	B. 1.
The Return to the Farm	Troyon	B. 1; P. 1; Wil. I.
The Return to the Sheep Fold		Cosmos.
Shepherdess Knitting	Millet	B. 1; P. 1; Prang 5; F., 12 x 17, $4; C., 8 x 12, $3; 6 x 9, $1.50; Cosmos.
On the Southdowns	James Aumonier	*I. S.*, Sept., 1900.
In Charge of the Flock	Mauve	C., 6 x 9, $1.50; 10 x 12, $3; 16 x 20, $6 (colored); 9 x 12, $6; 16 x 20, $12; F., $1.
Sheep Washing	James Aumonier	*I. S.*, Sept., 1900.
The Lost Sheep	Charles Jacque	C., 6 x 13, $2.50; 4 x 9, $1.25.
Evening	Mauve	F., $1; P. 5.
A Flock of Sheep	Mauve	F., $1; Cosmos.
The Return of the Flock	Millet	L., 7½ x 9½, $2; 10 x 13½, $3; F. 1.
Highland Sheep	Rosa Bonheur	L., 6¾ x 9¼, $1.50; 9¼ x 13, $2.50; Braun, 14 x 18, $4.

SUBJECT	ARTIST	PUBLISHER
Sheep in Pasture	Auguste Bonheur	T. B.; T. S.; T. P.
Down the Lane by Twilight	Wiggins	C., 13 x 10, $2.50.
In the Fold	Henry Troth	*L. H. J.*, May, 1901.
Sunset Glow	Riecke	Soule.
Sheep		*C. L.*, Nov., 1901; Steiger's Chart.
Midsummer Day	Lumputten	F.

2. WILD ANIMALS

Pictures of the common birds may be found in colors among the two-cent Perry pictures and the twenty-five cent Prang (11 x 14) pictures.

Colored pictures of other animals may also be found among the two-cent Perry illustrations, but these are not of much value, although they have been mentioned in this outline where no better was known.

Steiger & Co. publish a number of colored charts of wild animals, many of which are good as regards structure, but the coloring is sometimes harsh.

A set of twelve animal pictures by Ernest Seton-Thompson is published by Charles Scribner & Co. $6 for the set or 60 cts. each.

The following list is somewhat miscellaneous in character, and gives comparatively few illustrations out of the large number that might be mentioned.

SUBJECT	ARTIST	PUBLISHER
Antelope	Seton-Thompson	Scribner.
Baboon		P. 2; M. 2.
Bear (head)	Seton-Thompson	Scribner.
Bear and Cubs	Seton-Thompson	Scribner.
Bear and Cub (Johnny)	Seton-Thompson	Scribner.
Bear Pictures	Seton-Thompson	*C. Mag.*, 1900.
Bear (black)		H. 1; M. 1.
Bear (white)		*M. Mag.*, April, 1901.
Bison (head)	Seton-Thompson	Scribner.
Boar		M. 2; A.
Beaver	Photo Reproductions	*E. Mag.*, March, 1901.
Beavers' House	Photo Reproductions	*N. S.*, March, 1901.
Beavers	Photo Reproductions	*E. Mag.*, April, 1901.
Beaver	Photo Reproductions	*E. Mag.*

SUBJECT	ARTIST	PUBLISHER
Coyote	Seton-Thompson	Scribner.
Deer		A.; S.
The Monarch of the Glen	Landseer	B. 1; P. 1.
The Deer Pass		Cosmos.
Red Deer of Chillingham	Landseer	B. 1; P. 1.
Wild Deer	Hein	W. Photo.
A Highland Lassie and Fawns	Landseer	P. 1.
A Deer Family	Landseer	P. 1.
Fawn	Remington	H. 1.
Stag Feeding	Kröner	Ber., 8 x 10, $1.
Reindeer	Frost	H. 1.
Moose Deer	Frost	H. 1.
Moose Deer	Remington	H. 1.
Elephant		*E. Mag.*, April, 1901; P. 1.
Elephant Hunt		H. 1.
Elephant Ride		H. 1.
Fox		S.; P.
Young Foxes	Carter	B. 1.
Mother and Young Foxes	Seton-Thompson	Scribner.
Arctic Foxes		H. 1; A.
Giraffe		P. 1; A.; S.
Giraffe		S.; P. 1; A.
Gopher		P. 2.
Ground Hog		P. 2.
Hare		P. 2; M. 2.
Hippopotamus		P. 1; A.
Jaguar		P. 1; H. 1; A.
Kangaroo		H. 1; P. 2; A.; S.
Leopard		A.; P. 1.
Lion		H. 1; S.; Woodbury.
An Old Monarch		Cosmos.
Lion and Lioness		Cosmos; T. B.; T. S.; T. P.
Head of an Asiatic Lion		P. 2; O., 8 x 10, $1.50.
Study of a Lion	Landseer	E., 19 x 25, $3.
Study of a Lioness	Bonheur	Braun, $4.
Lion at Home	Bonheur	B. 1; P. 1; T. B.; T. S.; T. P.
African Lion		P. 2; A.
Mole (common)		P. 2.
Mink		P. 2.

SUBJECT	ARTIST	PUBLISHER
Muskrat		P. 2.
Rabbit		P. 1; S.
Rabbits	Fisher	H. 1; Hanf. C., F. & R.
Rabbit	Durer	B.
Raccoons	Seton-Thompson	Scribner.
Rhinoceros		P. 1; H. 1; A.
Squirrel		H. 1; *E. Mag.*, April, 1901.
Tiger		P. 1; A.; S.
Tiger	Hunt	P. 1.
An Interrupted Feast	Church	M. 1; H. 1; T. B.; T. S.; T. P.
Wolf		H. 1; A.
Zebra		P. 1; A.

II. Plant Life

A set of three pictures published originally by the Chicago Photo Reproduction Co., and now sold by the Perry Picture Co., are very excellent. On each sheet there is a picture of the tree, a spray of leaves and portion of the trunk to show the bark.

The Lewis Leaf Charts are also valuable, and may be obtained from all dealers in school supplies.

Among the illustrations in government publications, the following will be found most excellent:

Practical Forestry in the Adirondacks. D. of A., Div. of Forestry, Bul. 26.

The Forest Conditions of Porto Rico. D. of A., Div. of Forestry, Bul. 25.

Big Trees in California. D. of A., Div. of Forestry, Bul. 28.

The White Pine. D. of A., Div. of Forestry, Bul.

By applying to the Secretary of Agriculture, a monthly list of publications will be forwarded, and from this list selections of papers may be made. All Farmers' Bulletins are furnished free.

Cornell University publishes Nature Study leaflets for teachers free of charge.

A useful one in studying the oak tree is

The Leaves and Acorns of Our Common Oaks. Cornell Leaflet, Bul. 8.

Most plant life can be studied directly from portions of or the entire growing plant, so that illustrations have not the same value for this part of the nature work that they have for animal study.

III. Industries

1. *Baker*

SUBJECT	ARTIST	PUBLISHER
Baker		Prang, 22 x 14 (colored), 50 cts.

2. *Blacksmith*

Village Blacksmith	Herring	B. 1; P. 1; *N. S.*, March, 1901.
Blacksmith	Frere	P. 1.
Shoeing a Bay Mare	Landseer	B. 1; P. 1; Hanf. R.; Braun, 14 x 18, $4.
The Blacksmith	Philip Wouvermann	T. B.; T. S.; T. P.
Blacksmith		Prang, 22 x 14, 50 cts. (colored).
Blacksmith Ready for Welding	Henry Sandham	F.

3. *Carpenter*

Carpenter		Prang, 22 x 14, 25 cts. (colored).

4. *Farm Life*

The Gleaners	Millet	Braun, 8 x 10, $2; 14 x 18, $4; P. 1, 5, ½; Prang; B. 1; Wil. II; E. II, III, IV; W. Carbon, 28 x 28, $2.25; W. Photo Prints, 25 cts.; Cosmos; T. B.; T. S.; T. P.
The Balloon	Jules Dupré	W. Photo; Wil. I; B. 1; P. 1, ½; H.
The Haymaker	Adam	H., 28 x 35, $4; Braun, 14 x 18, $4; 8 x 10, $1.50; Wil. I; Au. 19 x 14½, 40 cts.

SUBJECT	ARTIST	PUBLISHER
The Gleaners	Breton	H., 28 x 35, $4; E. II, III & IV; Au., 28 x 35, $10; Braun, 14 x 18, $4; 8 x 10, $1.50; B. 1; P. 1, 5, ½; T. B.; T. S.; T. P.
The End of Labor	Breton	P. 1; Au. $10; Braun, 24 x 30, $15; 14 x 18, $4; 8 x 10, $1.50.
The Angelus	Millet	B. 1; P. 1, 5, ½; Wil. II; E. II, III; W. Platinum, 8 x 10, 75 cts.; 10 x 13, $1.75; W. Photo Prints, 25 cts.; Braun, 14 x 18, $4; T. B.; T. S.; T. P.
Spring	Millet	Wil. II; Braun, 8 x 10, $2; 14 x 18, $4.
The Sower	Millet	Wil. II; P. 1, 5; B. 1; T. B.; T. S.; T. P.; W. Photo; F. Water colors and drawing, 75 cts.; Braun, 8 x 10, $2.
The Mowers	Dupré	Cosmos.
The Man with the Hoe	Millet	B. 1; P. 1, 5, ½; E. II; W. Photo; Braun, 14 x 18, $4.
The Shepherdess	Millet	E. II, III; W. Carbon, 28 x 28, $2.25; Braun, 24 x 30, $15; 14 x 18, $4.
Haying Time	Julien Dupré	E., 27 x 40, $2.25; Braun, 14 x 18, $4; 8 x 10, $1.50.
The Song of the Lark	Breton	H. 1; E. II, III, IV; Wil I; W. Carbon, 28 x 28, $2.25; H., 28 x 35, $4; W. Photo; Braun, 24 x 30, $15; 14 x 18, $4; B. 1; P. 1, 5.
The Cornfield	John Constable	E. I.
In the Country	H. Lerolle	E. II, III, IV; W. Carbon, 13 x 17, $4.
Autumn Oaks	Inness	W. Photo.
Spring Time	Daubigny	W. Platinum, 8 x 10, 75 cts.; 10 x 13, $1.75.
A Summer Day	Breton	C. 16 x 20, $6.00; 9 x 13, $2.50; 6 x 9, $1.50.

SUBJECT	ARTIST	PUBLISHER
Feeding the Hens	Millet	B. I; P. 1; Wil. I.
Woman Churning	Millet	Wil. I; B. 1; P. 1, 5.
The Harvest Time	L'Hernutte	Wil. I; B. 1; P. 1.
The Reapers	Breton	B. 1.
Farmyard, Normandy	Roll	B. 1; Wil. II.
Farmyard	Herring	B. 1.
Setting up Sheaves	George Clausen	*I. S.*, July, 1900.
Brittany Farmhouses	Corot	F. Platinum, 10 x 13, $2.
The Wood Chopper	Mauve	F. $1.
Brittany Kitchen	Theo. Robinson	F. Platinum, 7 x 13, $2.
The Farm at Barbizon	Rousseau	L. 5½ x 9½, $1.75; 8¼ x 13½, $2.75.
The Close of Day	Adam	Braun, 14 x 18, $4; 8 x 10, $1.50; Au. 11 x 17½, $1.50; H. 28 x 35, $4.
The Hayfield	Arnesby Brown	*I. S.*, Oct., 1900.
Graphic (cutting hay)	Ruth Robinson	*I. S.*, Oct., 1900.
A Barnyard Scene	Burdett Frost	H. 1.
The Farmyard	Paul Potter	Ber. 7 x 10, $2.
The Reapers	Hans Olde	*I. S.*, Nov., 1900.
Erute (cutting hay)	Hans Olde	*I. S.*, Nov., 1900.
Rustic (loading wheat)	Hans Olde	*I. S.*, Nov., 1900.
Summer Evening	Alphonse Stengelin	Braun, 14 x 18, $4.
Return of the Harvester	Jules Breton	Braun, 14 x 18, $4.
The White Cow (milking.)	Julien Dupré	Braun, 14 x 18, $4; 8 x 10, $1.50; H. 28 x 35, $4.
Before the Storm (loading hay)	Julien Dupré	Braun, 14 x 18, $4; 8 x 10, $1.50.
The Haymakers	Rosa Bonheur	Braun, 24 x 30, $15; 14 x 18, $4; 8 x 10, $1.50.
Daughter of the Fields	Jules Breton	Braun, 14 x 18, $4; 8 x 10, $1.50.
The Fire Alarm (In the hay field)	Jules Breton	Braun, 14 x 18, $4; 8 x 10, $1.50.
In the Corn Field; or, Country Lane	John Constable	Au. 16½ x 14½, $1.50.
The Valley Farm	John Constable	Au. 14 x 17, $1.50.
The Hay Field		*C. L.*, Nov., 1901, Dec., 1901.
Ranch Life (4 pictures)		D. of A. Bul. 62, 1899.
Gardening		Prang, 22 x 14, 50 cts.
Farm Yard		Prang, 22 x 14, 50 cts.
Haymaker		Prang, 22 x 14, 50 cts.
Storing and Keeping Fruits and Vegetables		*C. L.*, Dec., 1901.
The Farm Yard		S. 54 x 36, $2.50.

IV. Primitive People

1. *Primitive People*

SUBJECT	ARTIST	PUBLISHER
Primitive Life in the Far West		*C. Mag.*, Jan., 1902.
Indian Babies		*L. M.*, Jan., 1901.
Indians		*E. Mag.*, Jan. and Feb., 1901; *L. Mag.*, Dec., 1901; R. 1200 subjects from 40 different tribes. C. 9½ x 8½, $1.25.
The People of the Farthest North		*E. Mag.*, Jan. 1902.
Primitive People Mound Builders Indians Eskimoes, etc.		Eth. 2d, 6th, 9th, 13th and 16th Annual Reports.

2. *Primitive Industries*

Basketry		*L. Mag.*, Dec. 12, 1901.
Primitive People in the Far West		*C. Mag.*, Jan., 1902.
Development of the Book	Alexander	C.
Man at Work (weaving)		*P. I.*, Feb., 1901.
Making of the Navajo Blanket		*E. Mag.*, Jan., 1902.
Industry	Vesper L. George	F.
Indian Pottery		*O. Mag.*, Nov.; Eth.
An Indian Weaver	Geo. de Forest Brush	H. 1.
Attelage Basque	Stanhope Forbes	*I. S.*, May, 1901.

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FOR THE

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ANNOUNCEMENT OF VOLUME III — 1902

No. 1 January — Papers by Dr. D. C. GILMAN, Ex-President of Johns Hopkins University, Professor S. T. DUTTON and others on *Present Day Problems in Education.*

No. 2 March — *Chemistry and Physics in The Horace Mann High School.* — Professor J. F. WOODHULL.

Nos. 3 and 4 May and September — *Helps for the Teaching of Cæsar.* — Professor GONZALEZ LODGE and others.

No. 5 November — *The Record of a Year's Work in the Primary Grades of the Teachers College Schools.*

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TEACHERS COLLEGE RECORD

VOL. III MAY and SEPTEMBER, 1902 Nos. 3 and 4

HELPS FOR THE TEACHING OF CÆSAR

I.—INTRODUCTORY

BY GONZALEZ LODGE

The proper teaching of Cæsar depends in large measure upon two considerations: the previous preparation of the pupil, and the preparation and attitude of mind of the teacher.

In most of our schools the course in Latin extends over four years. Occasionally it is restricted to three, and more frequently it is five or six, but in the vast majority of the schools it is still limited to four years with five or four recitations a week. In a course so constituted it is customary to begin the *Bellum Gallicum* either at the beginning or shortly after the beginning of the second year. Now the ease and success of the teaching of the *Bellum Gallicum* in this case will depend very largely, from the pupil's point of view, upon the kind of work pursued during the first year.

Under what may be called the old régime, it used to be customary to follow a drill of several months in inflections by easy reading, not necessarily of a rigidly classical type, but embodying a concise and at the same time an interesting sketch either of the history of Rome, or of sacred history, or some of the easier fables made into the best Latin the editors could command. Later, however, a wave of Ciceronianism swept over the country,

and numbers of teachers who were not able themselves to distinguish between what was Ciceronian and what was not Ciceronian, what was bad Latin and what was good Latin, refused to allow in their courses any author to be read unless he belonged to the strictly classical period of the language. Nepos, Curtius and others were rigidly excluded, and of course all those reading books on which the earlier generations of pupils had fed were pushed aside. This made it necessary to begin the reading of Cæsar immediately after the class had gotten through the beginner's book.

The objection which was at once apparent, and which the teachers set themselves to overcome was this: Cæsar was entirely too difficult for pupils at this stage if they had been trained in the beginner's books in vogue at this period. It was necessary therefore to recast the vocabulary of the beginner's books so that pupils might come to Cæsar with a vocabulary that was mainly Cæsarian. The system of training thus evolved has prevailed up to the present time, but there have been signs in recent years of a revolt against it, and the recommendations of the Committee of Twelve, and of many influential scholars have been in the direction of increasing the interval between the beginner's book and Cæsar and filling that interval with reading matter of a simplified form which may serve in a sense as a bridge to the more difficult reading of the *Bellum Gallicum*.

It may be assumed, therefore, that the pupil when he begins Cæsar will have had at least one year of study of Latin, a year in which, in addition to the forms and inflections, he has acquired also a certain vocabulary made up almost entirely of words drawn from the *Bellum Gallicum*. The sentences that he has had to translate have been likewise taken from Cæsar, and his mind has rested upon battles and weapons, and Germans and Gauls, and rivers and mountains, and camps and soldiers, and ships and seas. To a certain extent, therefore, the break from his previous training to Cæsar is not a serious one.

Now with this training on the part of the child, we have to observe further what sort of an author Cæsar is. Almost every one agrees in stating that he is a difficult author. If this is the case, it may be asked why Cæsar has been chosen by the consensus of centuries for the first extensive reading in the school curriculum. If it were a question of the judgments of a

few individual teachers I might feel it necessary to enter very fully into a defense of the *Bellum Gallicum* as a text-book, but inasmuch as the number of opponents is extremely limited, and they are often convinced by the logic of circumstances, it seems only necessary to look into the general character of Cæsar's work.

In the first place we must recognize that the *Bellum Gallicum* is a book for adults. The greater part of Latin literature is composed of books of the same kind; in fact we have no books in Latin literature that were written for children. On the other hand, sound judgment requires that the reading which a child is required to go through with should be of a kind more or less fitted for his comprehension. Now the characteristics of a child's mind, as far as rational work is concerned, are directness, brevity, concreteness and action. Almost every event of a child's life is visualized; everything is strenuous, everything is in tangible form, and everything is short and quick. These characteristics also appertain to the life of the adult, but in addition there comes reflectivity, imagination, the realm of the ideal and psychological analysis. Consequently, we have to observe whether of the various books that would be available for instruction in Latin any one of these presents the characteristics adapted to the child's mind more than do the others, and is less dominated by the characteristics of the maturer mind than the others.

Professor Bennett, no friendly critic of Cæsar, after bringing forward all the arguments that could be adduced in support of his contention that Nepos should be read rather than Cæsar, is bound to admit that Cæsar has been proven by experience to be more interesting than Nepos to young students. In searching for the reasons he finds that Cæsar, while intended for mature minds, is written in a fashion that is readily assimilable by the less mature. Cæsar's vocabulary is much more concrete than that of Nepos. Cæsar deals with facts; Nepos indulges much more in character analysis. It might be added that Cæsar is replete with action; that his statements are models of directness; that the main characteristic of his style is brevity.

Accordingly from all points of view the qualities that are important to search for in a child's book are characteristic of Cæsar. I might emphasize that the *Bellum Gallicum* is as much more valuable than children's books with the same characteristics

could be, as the association of a child with a simple-minded, strong but sympathetic adult is more stimulating than association with one of his own kind.

Pupils are in the habit of approaching Cæsar through beginner's books which may be roughly divided into three classes. There is first the general beginner's book which is intended to cover in most cases a year of instruction and to give a vocabulary taken mainly from Cæsar but not entirely restricted to the words that he uses. There are a number of these upon the market, the most prominent being: *First Latin Book,* by Bain (University Publishing Co.), *Foundations of Latin,* by Bennett (Allyn and Bacon), *First Year Latin,* by Collar and Daniell (Ginn & Co.), *First Latin Book,* by Comstock (Allyn and Bacon), *Latin Lessons,* by Coy (American Book Co.), *The New Beginners' Latin Book,* by Hoch and Bert (Hinds & Noble), *Easy Latin Lessons,* by Lindsay and Rollins (Allyn & Bacon), *Beginners' Latin Book,* by Smiley and Storke (American Book Co.) and the *Beginners' Book in Latin,* by Tuell and Fowler (Sanborn & Co.).

The peculiar characteristics of most of these books are well set forth by Professor Bennett in the Teaching of Latin, p. 51. They separate the various parts of the forms, taking tense by tense and declension by declension, introduce the simpler principles of syntax early and attempt to stimulate the interest of the pupil by connected translation at the earliest moment. In the hands of competent teachers they have been found to be of great efficiency, but the criticism is made that in the hands of the inexperienced the pupils are less thoroughly grounded in the forms than in the older style of books which Mr. Bennett has tried to recall by his *Foundations of Latin.*

Most of these books, while having a vocabulary that is mainly Cæsarian, still are so constructed that they may be just as well followed by Nepos or by any other of the reading books that have been so widely adopted in recent years.

Two other books, of the same general scope, need on account of their name a little notice. One is entitled *Six Weeks' Preparation for Reading Cæsar,* by J. M. Whiton (Ginn & Co.). The aim of this book, which is devised and used in his own work by the author, is " an early familiarity with the inflections and com-

mon concords of the Latin which is at the foundation of all accurate scholarship." By means of copious exercises, both from Latin into English and English into Latin on a vocabulary that is apparently strictly Cæsarian, he aims to assist pupils to begin at a very early period the reading of Cæsar. If one may judge from the remark at the close of the preface, this volume should be followed by a small volume of extracts from Cæsar entitled *Cæsar's Invasion of Britain.*

The other book is entitled *A Straight Road to Cæsar,* by G. W. Waite and G. H. White (Ginn & Co.). This is a much larger book, contains all the paradigms as well as the exercises and it is expected, if we may judge from the exercises given, that the pupil will pass from this book immediately into Cæsar. So far as the contents of the book is concerned, there seems to be little difference between it and the other beginners' books except in matters of typography and individual caprice; which may be said to characterize most of the books that we have to deal with.

Of the remainder we have two groups: 1, The group which aims to introduce a pupil to the first book of Cæsar, and 2, The group that aims to introduce the pupil to the second book of Cæsar.

Of the first group the most important book is entitled *Bellum Helveticum,* by Lowe and Butler (Scott, Foresman & Co.). In this book we have, as usual, the various paradigms and exercises, but very early in the work — in fact as early as the third lesson — we begin with *Gallia est omnis divisa in partes tres;* and as the lessons go on the pupil is steadily pushed forward in the early part of Cæsar. In fact the object of the book is to give enough work for the whole first year, and take it all from the beginning chapters of Cæsar's *Gallic War.* So far as the general effect and arrangement of the book is concerned, every attempt seems to have been made to carry out this principle to its best results.

Another book called *Introduction to Cæsar,* by M. L. Brittain (American Book Co.), is similar in the arrangement of exercises and paradigms, and likewise in the insertion of reading material as early as possible. In fact connected reading appears in the very first lesson.

The third is called *Cæsar's Helvetian War,* by Welsh and

Duffield, Americanized by Sidney G. Ashmore (Macmillan Co.). This is but a reading book and pre-supposes a certain amount of grammatical study. The peculiarity of it consists in the fact that the first thirty chapters of the Helvetian War have been simplified and thereby, it is expected, relieved of a certain amount of their difficulty. In the book of Mr. Brittain the Latin of Cæsar has been simplified also. Whenever possible the exact words of Cæsar's are used, but the lessons are graded and difficult constructions are deferred. In the *Bellum Helveticum,* on the other hand, no attempt has been made to simplify the text.

The second group is composed, as I said, of those books which introduce the beginner to the second book of Cæsar. Chief of importance among these, on account of its widespread popularity, is the *Gate to Cæsar,* by W. C. Collar (Ginn & Co.). Professor Collar is very much convinced that Cæsar is a difficult author. Some parts of his *Gallic War,* he says, "are as hard or nearly as hard as any prose that has come down to us." He adds, "I know no more disheartening task than that of undertaking to carry a class, unprepared in age and knowledge of the language, through Cæsar's *Gallic War.*" And inasmuch as we should make our approaches with caution and skill, he asks the pertinent query, "Why not remove provisionally from the text those more intricate parts that discourage the learner and bar the way of progress?" With this end in view, he has edited the second book of the *Gallic War* in a simplified form. In doing this, his aim has been to keep the narrative intact and to retain as much of the text as was consistent with the effort to disburden it of its greater difficulties; and in addition, to make the fewest practical changes in what was retained. As a result, he has omitted about one-fifth of Cæsar's text.

A similar book is entitled *Cæsar for Beginners,* by W. T. St. Clair (Longmans). The only thing in which this book differs from the majority of beginners' books is (aside from its individuality), the use of the second book of Cæsar instead of the beginning of the first book for the reading lessons. This text has been adapted and simplified.

Still a third book entitled *Shortest Road to Cæsar,* by E. T. Jeffers (Hinds & Noble), presents the customary vocabularies, exercises, etc., and later the second book of Cæsar in a form unsimplified.

Now it seems that the first question that meets us in connection with all these books is one whose solution is vitally important in the matter of teaching Cæsar. First, shall we begin with the first book or with the second? In the nature of the case, the first book would be more difficult than the second, but in addition, the first book of Cæsar, considered by itself, is much more involved and difficult in its style than the second. It contains particularly a large amount of indirect discourse which comes early in the book. It has been replied in reference to the second book that it also contains a certain amount of indirect discourse, and that there is one sentence in the book which actually covers more than half a page and in which the subject is separated from the verb by ninety-four intervening words. Still it must be admitted that the second book is simpler than the first. Should then we begin with the second book, other things being equal? If we were studying Cæsar only for the purpose of the Latin to be gained from it there would be no particular reason why we should not begin in the simplest part of the treatise, whether that were the second book or the fifth or anywhere else; but it must be remembered that we are studying not merely Latin but, as has been frequently pointed out, history, literature and institutions. It would be regarded as absurd for a person who was expected to understand the development of the history of any period in modern times to begin midway in that period and leave the first part of it unattended to. The same thing holds true just as well in Cæsar. The first book of the *Bellum Gallicum* gives opportunity for the study of the reasons of Cæsar's invasion of Gaul, the occasion for it and its bearing upon Cæsar's own political fortunes. It also gives an opportunity for studying the system of ever widening campaigns, which is particularly characteristic of the Gallic conquest. This is all lost if we begin with the second book. It may be urged that the pupil will, of course, review the second book again after he has read the first; but the edge is off, the novelty has departed, and a review, no matter how skillfully conducted, can never have the value of the first reading. It would seem, therefore, that it would be better from the point of view of the treatise itself to begin with the first book.

Now as to the other set of books which begin with the Helvetian War. These would seem to meet the objection that

I have made, but if we think a moment we find that, with one exception, these books have the narrative simplified. In other words, we are reading not Cæsar, but a set of more or less detached sentences which cover the same ground that Cæsar does, but which, to the keen observer, will be found to have lost every bit of the Cæsarian character and to have very little more literary value than the detached sentences taken from all parts of the *Bellum Gallicum* that we find in the general beginners' books. It is replied that the pupil is expected to reread the Helvetian War too after he has acquired greater skill in translation. But here again the objection that I made with regard to the first set of books — those that begin with the second book — is equally valid. The narrative in its skeleton has already been read, and the first book of Cæsar after this partakes of the nature of a review lesson. We have nothing to look forward to, nothing that is mysterious, that must be unravelled, no suspense in battle or conference, no piquant anecdote to stimulate attention; all of this has been given in a simplified or skimmed-milk fashion already.

There remain then only two possibilities: one, that we should begin with the first book of Cæsar unsimplified, having insisted upon sufficient preparation beforehand, or going so slowly that it may be possible to meet the difficulties of this book as they appear. Of these two alternatives the first is undoubtedly the only one to be chosen, because a snail's progress, such as is required in the second, is just as apt to destroy the interest in the narrative as a review.

There is still the second possibility, however, which has been indicated in the remark of Collar already quoted, but which I should apply differently. The main difficulty in the first book consists in the long speeches in indirect discourse; these are admittedly difficult, and at this stage in a pupil's advancement are difficult for another reason. The speech is used so frequently to put the reader in possession of the situation and the question at issue that it requires more maturity of thought than the narrative, consequently, it would not be amiss for the skillful teacher to omit the speeches so far as translation is concerned, giving the translation of them in English to the class and reserving the Latin study of them until the class is sufficiently advanced to understand the principles of indirect dis-

course, and, consequently, to turn the indirect discourse into direct discourse for the purposes of comparison.

Now, prepared as the pupil is to enter upon the study of Cæsar, it becomes interesting to consider what the qualifications of the teacher should be.

It would seem to be hardly necessary to emphasize that the teacher of a language like Latin should be thoroughly equipped with a knowledge of the Latin literature in all its bearings, and of Roman history during the period of the Roman supremacy; and in the Latin language in all its intricacies and powers of expression. Fortunately, we can observe a very considerable betterment in the quality of our instruction during the last thirty-five years, and that quality is constantly improving under the pressure of the more rigid requirements of our boards of education. Still it would not surprise me if the vast majority of those who are teaching Cæsar had confined their knowledge of him to the four or five books which they are expected to teach, and were unaware from actual knowledge that he had written a *Bellum Civile,* or that he had written other things which have not come down to us, but which were no less celebrated in antiquity than the *Commentaries* which we have.

The vast mass of teachers, I should say, would also have had their training in one particular kind of instruction alone, would know only one grammar, and that a school or college grammar, would be entirely unacquainted with the vast philological knowledge on both sides of the Atlantic, and would have no general conception of the Latin literature beyond the few parts of authors that they read in college. I do not mean to say that such ignorance constitutes an insuperable obstacle to successful teaching. Many of the most successful teachers I have known were teachers whose actual knowledge of the subject was extremely limited. Here, as in most every department, the teacher is born rather than produced, and the teacher gifted by nature is able very often to make up by this natural gift for the lack of technical knowledge. But assuming that the teacher is a natural born teacher, it certainly is not too much to demand that to this natural equipment should be added all the knowledge and training which it is possible to obtain in preparation for the work.

It is very desirable that before entering upon the teaching

of the *Bellum Gallicum* the teacher should be thoroughly acquainted with the life of Cæsar and his relation to the times. In the period to which he belongs, the most interesting figures are Pompey, Cicero and Cæsar, and of these three the principal divergence of opinion has centred around Cicero and Cæsar. Many years ago, the great Professor Mommsen, in his *History of Rome*, undertook to show in Cæsar the greatest man that ever lived. This involved, in very large measure, the depreciation of Cicero and the exaltation of Cæsar by ignoring a great number of his manifest faults, or interpreting them to his advantage. To Mommsen Cæsar was a demi-god and Cicero a demagogue. The tendency since that time has been to moderate the view set forth by Mommsen, and to give Cicero the place which unquestionably belongs to him as a man of equal value with Cæsar in all this political crisis. Still the teacher of the *Bellum Gallicum* should become acquainted with Mommsen's picture of the period, not only on account of the importance of the critic, but also on account of the great keenness of mind and breadth of view shown in the analysis of the events of this period.

In addition to Mommsen, the first two volumes of Merivale's *History of the Romans* should be read, by all means. Merivale combines in his history of this period not merely accuracy of knowledge and soberness of judgment, but a lucidity and picturesqueness of style which makes the narrative as fascinating as a novel. People may differ with him as to the way he interprets some of the events of this period, but to my mind, he presents a much sounder view of the general life of Cæsar than does Mommsen, and when in addition you add the charm of his English style, you make a narrative which is in itself an educational influence to the one who reads. Particularly would I draw attention to the twenty-second chapter of his history, in which he analyses the character of Cæsar from all points of view.

These seem to me the most important works of general history that it is desirable the teacher should read, but in addition there are some specific biographies of Cæsar which must be studied. First of these I should put Warde Fowler's *Life of Cæsar*. This is written throughout with great sanity and soberness of judgment. The style does not show any particular charm, but it is lucid and clear, and without padding. In

many respects, it is the best book on the subject of Cæsar that the teacher can read, for in reading a general history the attention is apt to be distracted by the mass of subsidiary material, while in a work peculiarly biographical everything is interpreted, of course, from the point of view of the chief character. All of Cæsar's many-sidedness, all of his great intellectual power as shown in so many different fields, all of his cleverness as a politician through a most troublesome period and in the face of obstacles that would have daunted almost any man, all of his exceptional military ability and the peculiar characteristics of his personality which contributed so much to his elevation in the Roman world are most painstakingly and carefully brought out in this narrative of Fowler.

I would also draw your attention to Froude's book entitled *Cæsar, a Sketch*. He entitles it a sketch because, as he says, the materials for anything more than a sketch of Cæsar are not at hand; but practically it is as much a biography as is Warde Fowler's book, and is to be judged and criticised accordingly. The particular merit of Froude's book may be said to lie in its general style. The characteristics that he displays in his other historical writing are present in this also. While obviously attempting to be just and fair, no one would ever agree that he has succeeded in this work any more than he has in his history of England. His style is charming and his interpretation in most cases is correct, but in all that shows niceness of vision and command of detail, as well as power to interpret largely with due consideration to surroundings and conditions, he is defective. Still he is worth reading, if for no other reason, for his general picture.

These four books that I have spoken of are sufficient for the purposes that I have mentioned of getting a general estimate of the period and the great actors in it. It might also be desirable to study with some care the figure of Cicero, not because it will assist particularly in the teaching of Cæsar, but because it will add to the teacher's command of the field and assist him in forming a more correct judgment as to the position of this period in the development of Roman politics. With this in view, I should say that it would be desirable to read some life of Cicero, such as that of Strachan-Davidson, and some discussion of Cicero's relation to the public men of

his time, such for example, as may be found in Boissier's *Cicero and His Friends* or in the general introductions to Tyrrell's edition of Cicero's correspondence.

When it comes to the question of Cæsar's military work, we are on different ground. Here, of course, the teacher will be much more interested in the *Bellum Gallicum,* because that is what he will have to present to his pupils. Now for this presentation he must understand, as I have said already, in addition to the language and syntax, the importance of Cæsar's campaigns in Gaul from the point of view of universal history and also from the point of view of his own achievement. The latter will be of more immediate value. There have been numerous attempts to show the full spirit of Cæsar's military work in Gaul. The most valuable was undoubtedly that monumental work set on foot by the Emperor Napoleon III., and carried out by the extremely competent military officer, Colonel Stoffel. These researches cover the whole of France, and set at rest a number of vexed questions with regard to the exact locations of Cæsar's campaigns and the exact methods of procedure as outlined in his history. Careful surveys of all the country with photographs and drawings have made the plans of Cæsar's campaigns as clear almost to-day as they could have been to his own observation. The first part of this work appeared under the name of Napoleon; the second, the *Civil War,* more recently under the name of Colonel Stoffel. Since the appearance of this book, practically all our maps of Cæsar's campaigns in all the editions of the *Bellum Gallicum* published, have rested on this work of Colonel Stoffel, and it is likely that this work will form the basis of any subsequent discussion of the subject.

Of greater importance, however, than this at present, is the new work of Holmes on the *Conquest of Gaul* which appeared in 1901 (Macmillan & Co.). This is by all odds the most important contribution to the subject that has been made for a century. In the beginning we have a narrative of Cæsar's campaigns taken from and based upon his own story. To the one who reads Latin with readiness and with perception, it would need no emphasis that Cæsar's narrative is extremely picturesque and fascinating, but in the hurry of teaching and in the restriction of ideas which teaching very frequently brings, I am afraid that the most of our teachers fail to observe this pe-

culiarity in the *Bellum Gallicum*. To those, I would heartily commend the narrative of Holmes. It follows Cæsar so very closely, reproduces the ideas in the order in which he gives them, frequently almost in the language in which he gives them, and yet manages to preserve the life, vivacity, rapidity and lucidity of the original narrative. It is exceedingly stimulating and effective. This, however, is not the most important part of the book. The greater part of it is taken up with the appendices which give us the most recent scientific investigations on the subjects touched upon in the narrative; all the geographical names have been re-studied, all the geographical peculiarities have been searched out afresh, all the conflicting views of different scholars have been duly weighed and sifted; vexed questions as to localities are discussed in separate chapters, all the matters of ethnology and general antiquarian information which can be found in Cæsar are appropriately grouped; in other words, the book is an indispensable auxiliary to any mastery of the subject.

Another book that is very important for the teacher of Cæsar is entitled *Cæsar, a History of the Art of War among the Romans,* with a detailed account of the campaigns of Cæsar, by T. A. Dodge, Boston, 1892. Colonel Dodge is a soldier of excellent reputation and experience, who, finding that the campaigns of Cæsar had not been adequately treated from a military point of view, has written this exhaustive book to remedy this defect. Throughout it is very easy to observe that the author is a military man, and especial attention is paid to every thing that is of interest from a military point of view.

While Colonel Dodge is not a technical Latin scholar in the broadest sense, still his work is sound and trustworthy. What is particularly important is his discussion of Cæsar's method of fighting, as shown in chapter 23, which should be carefully read by any one who wishes to make this element in Cæsar's character clear to his students. Chapter 24 on Cæsar's army is also illuminating.

After all, however, the principal need in the equipment of the teacher of Cæsar will be a correct knowledge of the peculiarities of style and syntax that he displays. And it would be impossible to make a greater mistake than to suppose that Cæsar is normal in the use either of vocabulary or syntax. To a

large degree the vocabulary of any author is conditioned by the subject and the method of treatment. So in the case of Cæsar the vocabulary is essentially a military one — and hence very different from that of Cicero with whom the pupil is to be next occupied; and in addition it is, as has been above emphasized, very concrete; in this respect too being very different from that of Cicero.

These qualities, moreover, make Cæsar's vocabulary not difficult to learn and very available for the drill in prose composition which is essential at this point in a pupil's progress. But it must be used with caution because certain words are of very frequent occurrence while others equally important come more rarely. It has seemed to me therefore that a study of Cæsar's vocabulary from the point of view of the relative frequency of the occurrence of particular types of words might have great value to that teacher who is interested in giving his pupils as comprehensive teaching as his resources permit.

Then, again, the syntax of Cæsar, while of the best, is still very restricted as compared with that of Cicero. For example, a pupil reading Cæsar's *Bellum Gallicum* would never learn to use *quia,* and would have very little drill in the conditional sentences of the unreal variety. Such study would have to be supplementary and in the form mainly of composition work.

II

STUDIES IN THE VOCABULARY OF CÆSAR'S GALLIC WAR

By HENRY HOPKINS HUBBELL

One of the greatest difficulties that meets the teacher is to decide just how much to require of his pupils in the matter of vocabulary, as he proceeds with his reading. It is obvious that a number of the words the pupil comes upon occur too unfrequently to justify the teacher in requiring him to make them a part of his permanent knowledge. On the other hand, it is quite often true that if proper stress has been laid upon the acquisition of the vocabulary already encountered, a much more rapid progress will follow.

For these reasons it has appeared desirable to have the vocabulary of the *Bellum Gallicum* so arranged in lists that the teacher may not only know at any given time just how much ground has been covered, but may have also some indication as to the comparative frequency of the words already met with. Such has been done in the following lists.

It will be easily seen that the arrangement of words here made has a distinct advantage over the plan of some editors of printing new words in darker type. For it gives, at a glance, not only the new words of any particular chapter, but also the complete vocabulary that has occurred up to that point. Words which appear in the first book, but not in the second, and *vice versa,* are marked thus †, so as to afford a means of comparison between the vocabulary of these two books; while those used only once, twice or three times in the seven books are followed by one, two or three stars respectively. This will assist the teacher in selecting words which are to be especially empha-

sized, perhaps by means of prose lessons. Of course there will occasionally be words which, though occurring in the *Bellum Gallicum* only three times or less, he will recognize as sufficiently common elsewhere to warrant emphasis. But these must be left to the individual teacher. Such words as *is, hic, ille, qui,* etc., have been omitted, and indefinite pronouns, except most compounds of *quis,* have generally been included under adjectives. Of the personal pronouns, which are also omitted from the list, the third person alone is common; the first occurs once in the singular (IV. 25), and three times in the plural (I. 40, 44; II. 9), in the first four books, but twenty-four times in the remaining three; the second is not found at all in the first four books, but nine times in the last three. *Noster,* of the possessive pronouns, is of course common, being used so often to refer to the Romans; *meus* occurs once (ch. 25), in the fourth book and three times (chs. 38, 50 and 77) in the seventh; *tuus* is found only once (V. 44), while *vester* is used five times but all in the seventh book, which indeed contains a majority of all the uses of both personals and possessives (except indeed *sui* and *suus*).

Of course such word lists are useful in many ways, which will be at once evident. Not the least valuable function, however, would be to show the teacher what not to emphasize. Thus, in the description of the customs of the Veneti, a glance at the lists shows not only that a large number of new words are employed but that the most of these words occur very rarely. It would, as it seems to me, be the part of good judgment not to expect the pupils to have these words at command, not to set such a passage for review or for examination, not to base an exercise upon it, but to rest content if the class can make a fair translation of it at the first reading. The same considerations would hold good for that traditional bugaboo, the Bridge.

On the other hand, no better proof could be given of the inadequacy of any system of prose composition which is based upon Cæsar than the observation that such a common word as *civis* is not found before the seventh book; that *tamquam* only appears towards the close of the eighth book; that *quia* and *iste* are found only once each. Consequently the careful teacher will aim to supplement the Cæsarian vocabulary by such prose work as will require such additional words as belong to the proper command of the language.

BOOK I

SUBSTANTIVES

1. animus
bellum
†cultus
finis
flumen
†humanitas**
initium
lex
†lingua***
mercator
†mons
occasus
pars
proelium
provincia
†septentriones
sol
virtus

2. ager
civitas
†coniuratio
†consul
copia
†cupiditas
†dolor
†fortitudo*
†gloria
homo
†lacus***
latitudo
locus
milia
multitudo
natura
nobilitas
passus
regnum
res

3. amicitia
†amicus
annus
auctoritas
†biennium*
†carrus
exercitus
fides
†filia
filius
frater
frumentum
imperium
iter
iumentum
legatio
†matrimonium**
numerus
oratio
pater
pax
†plebs
populus
principatus
profectio
†semens*
senatus
tempus

4. arma
†cliens
†dictio*
dies
†familia
†fertilitas*
ignis
†iudicium
ius
magistratus
†mors***
mos
†poena
†suspicio
†vinculum

5. aedificium
consilium
domus
fossa
mensis
nihil
oppidum
periculum
†reditio*
spes

6. pons
ripa
vadum
vis

7. adventus
facultas
inimicus
iniuria
iugum
legatus
legio
maleficium
miles
princeps
spatium
†urbs
voluntas

8. altitudo
castellum
†conatus*
†concursus
†exemplum***
munitio
murus
†navis
opus — operis
pes
praesidium
†ratis***
telum

9. †angustiae
†beneficium
†deprecator**
gratia

†largitio*
obses
†via

10. hiberna

11. auxilium
conspectus
fortuna
fuga
hostis
liberi
†necessarius* (a relative)
†possessio
servitus
†solum
vicus

12. †avus**
calamitas
†deus
explorator
†lenitas*
†linter***
memoria
†oculus
†pagus
silva
†socer*
vigilia

13. †dolus**
dux
insidiae
internecio**
nomen

14. commutatio
contumelia
†dubitatio***
responsum
†scelus*
†testis
†victoria

15. agmen
eques
equitatus
†pabulatio
†populatio*
†praesentia
†rapina*

16. †frigus
†nex***
pabulum
potestas
†prex
†vergobretus*
†vita

17. †libertas
†plus
†seditio**

18. adfinitas**
†audacia***
concilium
†conventus
honor
†liberalitas**
†mater
nemo
†potentia
†pretium**
†soror**
†sumptus*
†uxor
†vectigal***

19. †interpres**
iustitia
†offensio*
studium
supplicium
†temperantia*

20. †adulescentia*
†amor*
†custos
†existimatio**
†lacrima**
†nervus**
ops
†pernicies**
respublica
verba
vulgus

21. ascensus
circuitus
†praetor*

22. acies
collis
†equus
impetus
intervallum
lux
†timor

23. †biduum
†decurio*
†fugitivus*

24. impedimentum
†phalanx
sarcina

25. †bracchium**
corpus
†ferrum***
gladius
†ictus**
latus
manus
pilum
pugna
scutum
signum
vulnus

26. †hora
littera
†matara*
nox
nuntius
†rota**
†sepultura*
†tragula
triduum
vallum
vesper

27. deditio
†inopia
salus
†servus

28. †bonitas*
condicio
†fames
†perfuga
ratio

29. caput
†census*
mulier
puer
summa
†tabula**

30. consensus
domicilium
†terra
usus

31. consuetudo
cruciatus
dicio***
†factio
†hospitium
†merces*
†nutus***
†potentatus*
rex
†sedes
victor
†victus

32. †crudelitas**
†cura***
†fletus**
†tristitia*
vox

33. †adrogantia***
spiritus

34. commeatus
†conloquium
†molimentum*
negotium
opus (indecl.)

35. †consulatus*

36. †stipendium

37. †tectum**

38. †arx**
†circinus*
difficultas
†radix

39. centurio
†exercitatio
†fatum*
magnitudo
†mens
†percontatio**
†pudor**
†tabernaculum***
†testimentum*
tribunus
†vultus**

40. †aequitas**
†amentia**
†avaritia**
cohors
†constantia**
diligentia
†disciplina
†diurnitas
†facinus
†felicitas**
furor***
imperator
†innocentia*
†laus
ordo
palus
†simulatio
tumultus

41. †alacritas***
modus
†satisfactio**

42. pedes
†pertinacia**
†sanitas**

43. aditus
†dignitas
†munus***
†necessitudo*
planities
†praemium
tumulus

44. †contentio
†detrimentum
†labor
ornamentum
regio
†testimonium

45. sententia

46. lapis

47. †adulescens
scientia

48. celeritas
cursus
†genus
†iuba*

50. †fas
luna***
†meridies
†sors***
†vaticinatio*

51. †reda**
species

52. cornu
†quaestor
subsidium

53. †gratulatio***
†hospes***
natio
†navicula*
†tergum
†voluptas***

54. aestas

374 substantives

ADJECTIVES.

1. alius
†cotidianus
extremus
fortis
inferior
longus
minor
omnis
proximus
reliquus
tertius
tres
unus

2. alter

altus
augustus
†cupidus
†dives*
finitimus
latus
magnus
†nobilis
†perfacilis***

3. †dubius
†firmus
multus
plurimus
potens

4. decem
†obaeratus*

5. †cibarius***
†duodecim**
privatus
quadringenti
†socius

6. †bonus
difficilis
duo
facilis
†perpauci
singuli

7. certus
nonnullus
nullus
ullus
†ulterior

8. complures
†invitus
novem
†sedecim**

9. novus

10. †bellicosus***
citerior
frumentarius
primus
quinque
septimus
superior

11. consanguineus

12. †immortalis
incredibilis
†inopinans
insignis
publicus
quartus
quattuor
solus
†uter

13. improvisus
†incommodus
pristinus
repentinus
†vetus

14. †conscius*
†diuturnus*
†recens
secundus

15. alienus
(amplus)
pauci
†posterus
quindecim
quingenti
†quini
†seni**
tantus

16. †annuus*
†maturus
necessarius
propinquus

17. †improbus*
quantus

18. adversus
†antiquus***
celer
equester
†familiaris
†liber
parvus
summus
†versus

19. egregius
†insciens**

20. dexter
†fraternus**

21. militaris
octo
†peritus***
†qualis**

22. captivus
†mille

23. †copiosus*

24. confertus
medius
†triplex
†veteranus*

25. commodus
defessus
sinister

26. †anceps**

27. dediticius
sex

28. par

29. †nonaginta*
†senex*

30. communis
†fructuosus*
opportunus
†stipendiarius***

31. barbarus
centum
ferus
gravis
†iracundus*
optimus
†peior*
†temerarius**
†viginti**

32. (ceterus)
miser***
†tristis*

33. †periculosus**
†turpis

34. †mirus**
uterque

35. †perpetuus
36. †deterior*
exercitatus**
†invictus*
38. †diurnus
†nocturnus
sexcenti
39. †ingens***
†mediocris
†timidus
40. †brevis
decimus
†imperitus
inermis
†praeteritus**
servilis
41. quinquaginta
42. legionarius
†quintus
43. aequus
†auctus*
†deni**
ducenti
†honorificus*
†iustus
†terrenus*
44. †gratus**
iniquus
48. †continuus
†durus
†velox**
49. idoneus
51. †alarius**
53. †honestus***
†incolumis
†trini

183 adjectives

VERBS.

1. abesse
appellare
attingere
†capere
†commeare**
contendere
continere
dicere
†differre
†dividere
†effeminare**
esse
gerere
†importare
incolere
†instituere
obtinere
oriri
pertinere
†praecedere*
prohibere
†spectare
vergere
2. †adficere
†bellare
exire
facere
habere
inducere
inferre
patere
persuadere
posse
potiri
praestare
†vagari
3. accipere
adducere
coemere**
comparare
conari
conciliare
conficere
confirmare
constituere
deligere
ducere
occupare
†perficere
permovere
†probare
proficisci
†sperare
†suppetere
†suscipere
4. cogere
conducere
†consciscere**
†cremare**
†damnare**
†enuntiare
†eripere
†exsequi*
incitare
†mori***
oportere
sequi
5. adsciscere**
†comburere*
†efferre
†exurere*
incendere
iubere
†molere*
oppugnare
parare
portare
recipere
subire
†tollere
transire
uti
6. convenire
existimare
expedire
†fluere**
†impendere**
†ire
pacare
pati
videre

7. †concedere
†deliberare***
imperare
intercedere
†licere
maturare
mittere
occidere
pellere
pervenire
†putare
†rescindere
respondere
reverti
rogare
sumere
†temperare***
tenere
†velle

8. †communire***
deicere
desistere
†disponere
†influere
iungere
†negare
†obducere*
†ostendere
†perducere
†perrumpere
repellere
venire

9. impetrare
†obstringere**
relinquere
studere

10. conscribere
emere**
hiemare
intellegere
praeficere
renuntiare

11. †abducere*
†consumere
debere
defendere
demonstrare
depopulari
expectare
expugnare
merere
populari
statuere
traducere
†vastare

12. †abdere
adgredi
concidere
impedire
interficere
indicare
mandare
†persolvere*
†ulcisci

13. adoriri
agere
committere
commovere
consequi
consistere
†curare
†despicere
discere
ferre
†niti***
†persequi
†perseverare**
†prodere
†reminisci*
†tribuere

14. accidere
†admirari
commemorare
consuescere
†decipere*
deponere
discedere
†dispergere
†dolere
†gloriari*
†oblivisci*
polliceri
satisfacere
†temptare
timere
vexare

15. cadere
coepisse
insequi
interesse
†lacessere
movere
praemittere
†propellere
†subsistere**

16. †accusare***
avertere
conferre
†conportare
convocare
†creare
†flagitare*
instare
metiri
nolle
ponere
praeesse
queri
†sublevare
†subvehere*

17. †coercere**
deterrere
dubitare
perferre
†praedari
proponere
superare
†tacere***
valere

18. †alere
audere
augere
conlocare
cupere
†deminuere
†designare*
desperare
dimittere

†favere**
†iactare***
†largiri**
†liceri**
†nubere*
†odisse**
perterrere
quaerere
†redimere
reperire
†restituere
retinere
†sentire

19. accedere
†animadvertere
cognoscere
†commonefacere*
†conloqui
†hortari
†offendere**
petere
†removere
†repugnare***
vereri
†vocare

20. †adhibere
†complecti***
†condonare**
†consolari
†crescere**
†flere
loqui
†minuere
monere
†obsecrare***
†orare
†prendere
†reprehendere
†scire
vitare

21. †accendere
considere

22. †abstinere**
†adcurrere**
†admittere
†comperire
instituere
†praecipere
†subducere

23. †commutare
confidere
convertere
†intercludere
†prospicere***
superesse

24. †advertere**
complere
munire
reicere
succedere
sustinere

25. †aequare**
aperire
circumvenire
claudere
cohortari
†conligare*
conspicari
†destringere**
†disicere***
emittere
†evellere*
inflectere**
†perfringere**
†praeoptare*
redintegrare
referre
resistere
†submovere
†subesse

26. vincere
conicere
intermittere
iuvare
morari
†obicere
pugnare
†subicere
vulnerare

27. †conquirere
egredi
†ignorare
†occultare
†parere
†perfugere**
poscere
†praeferre**
proicere
tradere

28. amittere
†purgare
reducere
†resciscere*
†tolerare
†vacare

29. redire

30. florere***
†gratulari*
†indicere
permittere
†repetere**
†sancire***

31. †adamare*
arcessere
†decedere
†edere*
†emigrare*
experiri
†frangere**
†implorare
†iurare**
†laborare
postulare
profugere
†recusare

32. †adesse
†demittere
†exprimere**
†horrere*
†intueri*
†mirari***

33. †cogitare
occurrere

34. †contrahere
†placere
possidere***

35. censere
†gravare*
†invitare
†neglegere
reddere

36. congredi
†denuntiare***
†manere
†pendere
praescribere

37. coniungere
†transportare

38. †cingere
circumdare
†circumducere
†contingere
efficere
†praecavere*
procedere
†proficere

39. audire
†fingere***
†miserari**
†obsignare*
perturbare
†praedicare
†remanere
†supportare

40. †appetere
armare
†convincere*
†defatigare
deesse
impellere
incusare**
†indulgere**
†offerre
perspicere
†repraesentare*
†repudiare*
†subministrare***

41. †exquirere**
†innasci**

42. †denegare*
detrahere
†imponere
†interponere
†rescribere*
†respuere*

43. adferre
†consulere
†deperdere***
†devehere***
decere
remittere
†vehere*

44. decertare
deducere
†impugnare**
†interpellare*
†observare
†opprimere
†remunerari*
†simulare**
†subtrahere**
†suspicari

45. deserere
†ignoscere
redigere

46. †adequitare*
†dirimere*
†inicere
†interdicere

47. †conclamare
conspicere
†donare**
†peccare
†speculari*

48. adaequare
†circumsistere
concurrere
†decidere*
†exercere
†prodire
†producere
promovere
versari

49. †propulsare**

50. †declarare*
progredi

51. pandere

52. †excipere
†insilire*
premere
†procurrere
†revellere**

53. †deligare
fugere
incidere
†nancisci
†necare
†perire
†reservare
†trahere**
†tranere*
†vertere
†vincire*
†praeponere**

475 verbs

ADVERBS

1. †continenter***
etiam
fere
propterea
quoque
†saepe

2. facile
undique

3. item
non
quam
†satis

5. iam
†praeterquam**
una

6. nuper
†omnino
vix

7. nondum

8. †interdiu***
†interea
noctu
†nonnumquam

9. itaque
†sponte

10. ibi
inde

11. ita
paene

13. aegre
magis
magnopere
†quare

14. graviter
†impune*
†insolenter*
interdum**
tam

15. audacter
circiter

16. cotidie
diu
interim
modo
praesertim
quidem

17. †antea
†demum
†privatim***
†quamdiu*
tum

18. contra
†illic**
†largiter*
†secreto**
†semper

19. †iniussu**
†separatim***
simul

21. postea

22. denique
prope

23. postridie
†pridie

24. supra

25. †bipertito**
rursus
†tandem

26. acriter

27. †suppliciter*

29. nominatim

31. †iterum
nunc
†semel**
†superbe*
†tantopere*
†coram**
†velut*
vero

33. †imprimis
paulatim
†saepenumero

34. †praeterea

36. †quemadmodum
†quotannis

37. †vehementer

38. †huc
sic

39. subito

40. †adroganter*
†aliquamdiu**
†male*
plerumque
†praecipue**
†temere

41. †unquam

42. †citro*
†irridicule*
†quotiens**
†ultro

44. †libenter***
†numquam
sicut

45. potius

47. †post

48. totidem

49. †setius

50. paulum
†usque
†ultrimque

51. †generatim**

52. †comminus***
†desuper*
†repente

53. statim
†ter*

116 adverbs, etc.

BOOK II

SUBSTANTIVES

1. animus
   exercitus
   facultas
   fossa
   hiberna
   homo
   imperium
   †levitas***
   littera
   locus
   †nobilitas**
   obses
   pars
   populus
   regnum
   res
   †rumor
   vulgus

2. aestas
   castra
   copia
   dies
   finis
   legatus
   legio
   †longitudo
   manus
   negotium
   nuntius
   pabulum

3. arma
   civitas
   fides
   frater
   frumentum
   furor***
   ius
   lex
   magistratus
   †opinio
   oppidum

4. adfinitas**
   ager
   auctoritas
   auxilium
   bellum
   concilium
   iustitia
   milia
   multitudo
   nomen
   numerus
   pater
   †propinquitas
   prudentia
   regio
   rex
   spatium
   spiritus
   summa
   virtus
   voluntas

5. altitudo
   cohors
   commeatus
   explorator
   flumen
   hostis
   latus
   liberi
   opus
   oratio
   periculum
   pes
   pons
   praesidium
   princeps
   respublica
   ripa
   salus
   senatus
   tempus
   vallum

6. †defensor
   gratia
   impetus
   iter
   lapis
   †moenia
   murus
   nobilitas
   nox
   †oppugnatio
   passus
   pax
   †porta
   potestas
   subsidium
   telum
   †testudo

7. adventus
   aedificium
   †defensio**
   dux
   †fumus**
   †funditor
   ignis
   latitudo
   †oppidanus
   spes
   studium
   vicus

8. acies
   castellum
   collis
   †deiectus**
   †frons
   natura
   opus (indecl.)
   planities
   proelium
   †tormentum

9. consilium
   eques

initium
palus
usus
vadum

10. †armatura
corpus
domus
equitatus
ratio
sententia

11. agmen
†clamor
fuga
insidiae
lux
miles
†necessitas
occasus
ordo
profectio
sol
†speculator**
†strepitus***
tumultus
vigilia

12. †agger
castra
celeritas
deditio
magnitudo
memoria
†terror
†turris
†vinea

13. filius
mos
mulier
†natu***

14. puer
amicitia
calamitas
†clementia**
contumelia
†discessus
indignitas**
†mansuetudo**
ops
servitus
verba
vox

15. aditus
conditio
honor
†luxuria*
mercator
†mora
nihil
†vinum**

16. †aetas
fortuna
pugna
triduum

17. †arbor
centurio
consuetudo
impedimentum
†instar*
†munimentum*
†ramus
†rubus*
†saepes**
sarcina
†sentis*

18. †portorium**
silva
†statio

20. †brevitas
difficultas
scientia
signum
†successus*
†tuba***
†vexillum***

21. †exiguitas
†fors
†galea*
scutum
†tegimentum**

22. eventus
†iniquitas
†prospectus***

23. cornu
cursus
gladius
intervallum
†lassitudo**
pilum
vulnus

24. †calo
†decumanus***
†fremitus***
iugum
pedes
victor

25. †cohortatio*
conspectus
imperator
manipulus
†opera
†primipilus
†signifer*
†vir

26. tribunus

27. †cadaver**
commutatio
tumulus
†turpitudo*

28. †aestuarium**
consensus
iniuria
internecio
maleficium
†misericordia
†senator*

29. annus
circuitus
†custodia
†despectus
domicilium
†obitus*
†pondus
provincia
†ripes*
†saxum
†trabs

30. †contemptus*
†excursio*

†machinatio***
†onus
†statura**
vis

31. cruciatus
inimicus
modus
species
supplicium

32. †acervus*
†aries***

33. ascensus
caput
†cortex
†eruptio
munitio
nemo
†pellis
†significatio
vesper
†vimen***

34. dicio

35. hibernaculum*
legatio
natio
†supplicatio***

287 substantives

ADJECTIVES.

1. certus
citerior
†creber
minor
nonnullus
novus
omnis
potens
tertius

2. duo
difinitimus
frumentarius
†interior
†longinquus
quindecim
reliquus
unus
celer

3. (ceterus)
consanguineus
improvisus
primus
proximus
tantus

4. centum
communis
decem
†ferax*
ferus
latus
longus
magnus
militaris
novem
plerusque
plurimus
quantus
quinquaginta
†sexaginta*
solus

5. alter
extremus
publicus
sex
tutus

6. nullus
octo
summus

7. (amplus)
medius
†sagittarius

8. adversus
†editus
equester
†eximius*
†idoneus
inferior
†lenis
opportunus
quadringenti
†transversus*
uterque

9. †neuter**
secundus

10. alienus
†domesticus**
iniquus
†levis
optimus

11. †consimilis***
multus
†prior
tres
ullus

12. pauci
†vacuus

14. quinque

15. †patrius*
sexcenti

16. captivus
†inutilis

17. complures
†dediticius
†pedester
singuli
†tener*

18. †contrarius
†declivis
ducenti
par
†silvestris
superior

19. incredibilis
†transgressus***

20. alius
commodus
exercitatus**
insignis

21. †accomodatus
decimus
necessarius
pristinus

22. †densus
†diversus
†varius**

23. confertus
dexter
†nonus***
†octavus***
septimus
sinister
†undecimus**

24. †praeceps***
singularis

25. angustus
fortis
gravis
quartus
†tardus**

26. altus
difficilis
facilis
inermis
legionarius

28. miser***
quingenti
†supplex*

29. †duplex***
egregius
†praeacutus
†prognatus**

30. †parvulus
†tantulus

31. †divinus***
†inusitatus***

33. †arduus**
†indiligens**
quatuor
repentinus
†universus

34. †maritimus

35. barbarus
propinquus

143 adjectives

VERBS.

1. †adducere
adferre
†coniurare
consequi
dicere
esse
facere
ferre
habere
hiemare
†inveterascere**
nolle
occupare
pacare
posse
†sollicitare
studere
vereri
versari

2. coepisse
cognoscere
commovere
comparare
conducere
conscribere
deducere
dubitare
existimare
gerere
†incipere
†inire
mittere
movere
proficisci
venire

3. coniungere
†consentire***
deterrere
†exanimare
imperare
incolere
iuvare
parare
permittere
recipere
uti

4. abesse
appellare
armare
conficere
considere
†eligere*
†expellere
†explorare
†ingredi**
obtinere
oriri
polliceri
possidere***
postulare
prohibere
quaerere
reperire
sumere
traducere
valere
vexare

5. cogere
cohortari
†confligare
convenire
dimittere
†distinere
docere
efficere
interesse
†introducere***
iubere
mandare
maturare
munire

ponere
populari
portare
†prosequi
reddere
relinquere
videre

6. †circumicere*
conicere
consistere
†iacere
†nudare
oppugnare
praeesse
†submittere
†subruere**
†succendere
†sustentare
sustinere

7. accedere
†adire
contendere
depopulari
discedere
incendere
morari
nuntiare
patere
potiri
†propugnare***
†significare

8. audere
circumvenire
conlocare
constituere
ducere
educere
instruere
intellegere
†periclitari***
pugnare
redire
statuere
†supersedere*

9. adgredi
conari
expectare
expugnare
impedire
†interscindere**
reducere
transire

10. †adpropinquare
convocare
decertare
defendere
†deficere
†fallere
interficere
occidere
persuadere
progredi
repellere
reverti

11. adoriri
concidere
continere
desistere
egredi
†exaudire
fugere
perspicere
perturbare
pervenire
petere
praeficere
praemittere
†properare***
†subsequi

12. agere
audire
†conservare
impetrare
permovere

13. accipere
aperire
conferre
pandere
†tendere
tradere

14. consuescere
impellere
incīdere
inferre
perferre
profugere
redigere

15. †attingere
†dedere
†increpitare
incusare**
pati
pertinere
poscere
praestare
proicere
†relanguescere*
remittere

16. experiri
†invenire

17. †adiuvare
deligere
†diripere
†enasci*
†incīdere*
inflectere**
intercedere
†intericere
†intrare***
†omittere***
pellere
†praebere
sequi

18. †nasci
nominare
vergere

19. †cedere
claudere
committere
dimetiri
expedire
insequi
†latere**
†porrigere*
†protubare**
†provolare*

20. †administrare
arcessere

concurrere
oportere
praescribere
procedere
proponere
†revocare
†vetare***

21. †adicere
conspicere
†decurrere
deesse
†detrudere*
†devenire**
†dimicare
inducere
occurrere
retinere

22. †providere
resistere

23. †compellere
congredi
emittere
†obvenire***
†proeliari
†profligare**
redintegrare
tenere

24. complere
desperare
†dissipare***
perterrere
premere
renuntiare
†respicere
superare

25. amittere
cupere
deserere
detrahere
†excedere
instare
intermittere
†laxare*
†navare*
subire
†tardare
†urgere***
vitare
vulnerare

26. avertere
conspicari
convertere
incitare
monere
timere

27. ascendere
cadere
†coacervare**
debere
deicere
†delere
†inniti*
†insistere
†intercipere
iacĕre**
indicare
†procumbere
superesse

28. †colligere
commemorare
vincere

29. deponere
†exagitare**
†scribere

30. †circummunire*
confidere
†extruere
†irridere*

31. †celare***
†deprecari
†despoliare*
†dominari*
†invidere*
loqui
promovere

33. adaequare
merere
†patefieri***
respondere

33. †credere
emere**
exire
†intexere*
†intromittere
referre
refringere**
reicere
†servare
vendere***

35. accidere
†decernere

320 verbs

ADVERBS.

1. †contra
diu
etiam
facile
ita
item
†moleste*
†partim
supra

2. circiter
†constanter**
non
tum
vero
quidem

4. †antiquitus
ibi
nunc
propterea
sic
totidem

5. †diligenter
iam
†liberaliter***
magnopere
†quantopere**

6. aegre
   undique
7. itaque
   †paulisper
8. cotidie
   †paulatim
   †paululum*
9. interim
   †protinus
10. acriter
    audacter
    potius
    quam
    quoque
11. †fortiter
    nondum
    statim
12. postridie
16. una
17. modo
    postea
18. †aequaliter*
    †introrsus
19. †aliter
    †identidem*
    inde
    paene
    rursus
    subito
20. paulo
21. tam
22. magis
23. fere
24. simul
25. nominatim
26. †iuxta*
27. †nequiquam*
28. †generatim
    †prope
    vix
30. plerumque
    praesertim
    †procul
32. sicut
33. denique
    noctu

72 adverbs, etc.

BOOK III

SUBSTANTIVES

1. vallis
2. culmen*
   paucitas
3. captus*
4. gaesum*
5. pilus***
7. hiems
8. exitus
   gubernator**
   ora
   portus
9. inscientia
   nauta**
   navigatio
   remex*
10. defectio
    rebellio
11. classis
12. aestus
    lingula*
    moles
    opportunitas
    promunturium*
    situs
    tempestas
13. aluta*
    ancora
    carina*
    cautes*
    clavus*
    congressus*
    copula*
    crassitudo**
    decessus*
    digitus**
    firmitudo**
    fluctus
    funis
    linum*
    pollex*
    prora*
    pulsus*
    puppis**
    remus
    robur*
    rostrum**
    transtrum*
    velum***
    ventus
14. antemna***
    armenta**
    certamen**
    falx
    forma
    longurius***
    malus**
    navigium***
15. interventus*
    malacia*
    tranquilitas**
16. corona**
    iuventus***

17. auctor
contemptio
cultura
latro**

18. confirmatio*
cunctatio**
occasio
pollicitatio
sarmentum*
virgultum*

19. defatigatio*

20. convallis**
proconsul**

21. adulescentulus*
cuniculus
sectura*

22. soldurii*

25. caespes***

26. campus**

29. continuatio*
imber
materia
pecus

33. sectio*

86 substantives

ADJECTIVES

1. aliquot***

2. plenus

4. integer
sancius**

5. languidus**

7. subitus**

8. nauticus*
vectigalis**

9. inviolatus*
sanctus***
vastus**

12. rarus

13. aliquantus**
aptus***
ferreus
pedalis*
planus
similis
tenuis

14. absimilis*
muralis***

15. bini
terni***

17. perditus**

18. callidus*
laetus*

19. alacer
mollis**
navalis**
promptus*

21. aerarius*
fretus**

24. infirmus

25. auxiliaris*

26. intritus*

27. ultimus

29. deinceps
imprudens**

38 adjectives

VERBS

1. attribuere

2. abstrahere***
adiungere
renovare**

5. erumpere*
reficere
scindere**

6. commutare
constare
demorari*
exurere
fundere**
meminisse**

7. cooriri
antecedere
malle**
navigare
recuperare

9. aedificare***
concludere*
noscere

10. conspirare*
distribuere
excitare
partiri

12. adflictare**
appellere***
deportare*
detinere**
extrudere*

13. configere*
erigere**
extimescere
nocere
regere**
revincire
saevire*

14. abscindere**
adfigere*
concīdere
comprehendere
inserere*
ornare**
praeparare***
praerumpere***
reprimere**

15. consectari
existere
transcendere**

16. vindicare***
17. carpere*
    defigere***
18. edocere
    pergere*
19. evadere*
20. aestimare
    evocare
    devovere***
    frui*
    intendere
23. cunctari**
    diducere**
    obsidere
25. circumire
    depellere
26. proruere*
28. evolare**
    exigere**
    provehere**
29. caedere**

70 verbs

ADVERBS

2. singillatim***
3. idcirco*
4. frustra
5. tantummodo*
10. mobiliter*
12. eiusmodi
    quando*
13. admodum
16. ubique*
17. nonnihil*
18. bene***
    clam
    parum**

13 adverbs, etc.

BOOK IV

SUBSTANTIVES

1. cibus***
   lac***
   venatio***
   vestitus
2. ephippium*
   vestigio
   amplitudo***
   gravitas**
4. metus
   triennium*
5. auditio**
   infirmitas***
   viator*
8. avis*
   ovum*
   piscis*
11. aquatio*
12. indutiae**
13. dementia*
    perfidia
16. occupatio**
17. aqua
    cratis
    derectus**
    fibula*
    firmitudo
    fistuca*
    iunctura*
    perpendiculum*
    rapiditas*
    sublica***
    tignum**
    truncus**
18. solitudo**
19. obsidio
    utilitas**
21. traiectus**
22. litus
    motus
24. essedarius
    membrum**
25. aquila
    dedecus*
    figura
    funda
    sagitta***
26. scapha*
27. culpa**
    imprudentia***
    orator*
29. perturbatio*
30. reditus***
31. aes
32. essedum
    pulvis*
33. auriga*
    currus**
    receptus***
    stabilitas*
    temo*
    turma
34. novitas***
    peditatus
    praeda
36. aequinoctium**
37. orbis
    perfugium*
    siccitas**

68 substantives

ADJECTIVES

1. frigidus*
   immanis**
2. ephippiatus*
   deformis**
   iners*
3. humanus**
   humilis
4. inscius**
   incertus
   mobilis*
   necesse
7. utilis***
9. frequens***
12. aureus*
    octingenti***
17. artus***
    bini
    bipedalis*
    obliquus**
    quadrageni**
    sesquepedalis*
20. exiguus
    incognitus**
21. fidelis**
22. onerarius
23. instabilis*
    septem**
24. aridus
    ignotus*
    insuefactus*
26. speculatorius*
37. trecenti***

31 adjectives 32

VERBS

1. adsuefacere
   lavare*
   separare**
   vivere***
2. delectare*
   desiderare
   desilire
   impendĕre*
   remollescere*
   sinere*
3. ventitare***
4. demigrare***
   remigrare**
5. paenitere*
   pronuntiare
   servire**
6. dissimulare*
   permulcere*
7. eicere
8. tueri
9. frumentari
10. citare*
    defluere*
    profluere*
12. subfodire*
13. communicare
    gaudere*
    praetermittere***
14. irrumpere.
15. abicere
    confluere**
    praecipitare**
16. finire***
17. consternere*
    contexere***
    discludere**
    distare
    immittere
    inligare**
18. exportare*
19. liberare
    succidere***
21. obtemperare*
22. anteponere*
    distribuere
    excusare*
23. conscendere***
    exponere
    solvere
25. contestari*
    evenire*
    inquit
26. aggregare**
27. commendare*
29. adflictare**
    auxiliari***
    reportare**
31. adfligere
32. delitescere*
    demetere*
    metere*
33. flectere**
    insinuare*
    moderari**
    percurrere*
    perequitare**
35. effugere***
36. duplicare**

68 verbs

ADVERBS

1. invicem**
2. quamvis*
11. quoad
13. mane***
14. adversus (prepos.)*
passim*
17. directe
insuper**
prone*
22. quominus**
23. nequaquam**
25. feliciter*
26. firmiter*
32. confestim
36. infra

15 adverbs, etc.

BOOK V[1]

SUBSTANTIVES

1. subductio*
humilitas*
incursio
arbiter*
lis*
2. transmissus*
3. familiaritas*
6. religio
8. egressus*
9. introitus*
11. faber*
12. nummus**
talea**
plumbum*
fagus*
abies*
lepus*
gallina*
anser*
13. dimidium*
bruma*
mensura**
14. caro**
vitrum*
color***
aspectus***
capillus**
labrum***
parens***
virgo*
17. pabulator*
18. sudes
19. semita**
incendium
24. confinium*
25. benevolentia**
impulsus*
26. lignator*
controversia
27. missus**
coactus
pietas*
30. disputatio**
31. dissensio
instrumentum**
languor*
33. desperatio*
35. femur*
os**
37. sermo***
ululatus**
aquilifer*
38. adiutor**
fama
lignatio*
40. quies
pruina
lorica***
valetudo**
42. ferramentum*
sagulum
43. argilla*
glans**
iaculum**
casa*
stramentum**
scala**
flamma***
recessus*
44. simultas*
verutum**
balteus*
vagina*
47. antecursor*
interitus*
caedes
48. epistula***
amentum*
laetitia**
49. rivus**
51. praeco*
52. temeritas
laetatio*
53. sollicitudo**
55. pecunia
transitus***
exsul*
56. conscientia*
pubes*
gener*

90 substantives

[1] From this point the words are not alphabetized.

ADJECTIVES

1. actuarius*
6. insuetus**
7. sanus*
8. vectorius*
meridianus*
annotinus*
12. infinitus***
aereus*
albus*
mediterraneus*
temperatus*
remissus*
13. septingenti**
triquetrus*
14. caeruleus
horridus*
duodeni***
15. perexiguus*
16. dispar**
18. acutus*
23. inanis**
24. quietus
28. ignobilis*
quantusvis*
30. clarus*
perendinus*
33. carus**
35. quispiam**
indignus***
40. aeger***
43. fusilis*
44. ambo*
45. asper*
52. diutinus*
54. praecipuus*
56. voluntarius*

37 adjectives

VERBS

1. onerare*
apportare*
percipere
2. collaudare
3. tangere*
labi**
4. exardescere*
6. adimere*
sevocare*
territare***
spoliare**
7. commorari**
flare*
postponere**
retrahere*
clamitare*
8. laudare*
9. praecludere*
12. colere**
examinare*
gustare*
13. occidere*
14. radere*
serere*
vestire***
inficere*
promittere*
17. pabulari***
advolare***
absistere*
18. praefigere*
tegere
exstare*
22. extrahere*
23. deperire**
excludere
24. provenire
25. regnare*
26. concitare
27. confiteri*
recuperare
levare*
29. ardere*
exstinguere*
descendere
30. terrere
sapere*
reposcere*
relegare*
interire
31. consurgere*
circumspicere***
excogitare*
33. trepidare**
concursare**
obire*
arripere*
35. refugere*
stare
conflictare*
traicere
subvenire
adhortari
36. parcere
elabi*
profiteri
39. adipisci*
40. praeurere***
centabulare**
attexere*
41. addere
ostentare
errare**
diffidere***
circumcidere**
exhaurire*

43. fervefacere**
parere**
torrere*
conflagrare*
recedere*
introire*
deturbare**

44. anteferre**
percutere*
protegere*
regredi*
succurrere**
diiudicare*

45. deprehendere
devehere**
perscribere**

48. adhaerescere*
demere*
perlegere*
recitare*

49. admonere*
elicere***
obstruere***

51. circummittere**
contemnere*
introrumpere*

52. expiare*

53. consultare**

54. praesentire**
suspicere*

55. allicere**

56. instigare*
publicare**

58. proterrere**
comprobare*

111 verbs

ADVERBS

6. obstinate*

10. tripartito***

13. vicies*

16. consulto**

19. tantum

25. palam***

26. praesto*

27. porro*
adeo

28. postremo

29. sero*

33. incommode*

34. proinde

41. tunc*

43. sicuti**

45. intus**

49. caute*

54. erga*
haud*

55. bis***

20 adverbs, etc.

BOOK VI

SUBSTANTIVES

1. delectus***
sacramentum*

2. societas*
foedus*

3. ver*
suggestus*

4. venia**
excusatio*
quaestio
clientela

5. iracundia**
odium**

12. iactura
inimicitia*
status***

13. tributum**
dominus*
druides
sacrificium
hereditas*
decretum***
contagio*
suffragium**

14. militia
vacatio*
immunitas*
versus*
anima*
sidus**
mundus*

15. ambactus*

16. morbus**
victima*
administer*
numen*
simulacrum**
furtum*
latrocinium***
noxa*

17. inventor*
ars*
quaestus*
mercatura*
artificium*
animal**

19. dos**
aestimatio*

fructus
funus**
cor*

21. duritia*
femina**
notitia**
occultatio*
rheno*

22. caseus*
cognatio**

23. infamia**
desidia*

24. colonia*
egestas*
patientia**

25. fera**

26. auris**

palma*
~~moe~~* bos*

27. alces*
capra*
varietas**
crus*
nodus*
articulus*
cubile*
venator*

28. urus
elephantus*
taurus*
velocitas*
fovea*
argentum**
epulae*
poculum*

reditus***
tabulatum*

30. comes*

31. taxus*

34. vicinitas*
stirps**

36. obsessio**
seges*

38. mentio*
discrimen*

39. frumentatio***

40. cuneus*

41. expugnatio**

43. latebrae*
saltus**

44. damnum*

90 substantives

ADJECTIVES

3. confinis*

4. aestivus*

8. infestus**

9. innocens**

10. nativus*

12. imperfectus*

13. impius*
sceleratus**

14. viceni

16. vivus

17. caelestis*

18. natalis*

19. illustris***
magnificus*
sumptuosus*

20. falsus*

21. impubes*
vicesimus*

21. proprius**
assiduus***

24. fertilis**

bellicus*
transmarinus*

25. rectus***

26. excelsus*
directus***

34. mutilus*

30. incautus*
imparatus*

34. talis

35. triginta*
fortunatus*

42. optatus*

~~32~~ adjectives
35

VERBS

1. resarcire*

3. transferre***

4. custodire*

5. concertare*
confugere*

7. devocare*

8. cernere

dirigere**
comitari*

9. laedere*
perquirere*

11. egere**

12. dicare**

13. procurare*
interpretari*

defugere*
excellere*
consecrare**

14. ediscere*
perdiscere*
disputare*

15. solere**

16. immolare**

vovere*
placare*

18. adolescere*
adsistere*

19. excruciare***
diligere*

21. perluere*

22. coire*

23. derogare*
violare**

26. diffundere*

27. applicare*
reclinare**
accidere*

28. durare*
assuescere*
mansuefieri*
circumcludere*

29. firmare*
maturescere*

31. detestari*

33. adiacere*

34. requirere**
insidiari*
circumfundere

35. sectari*

36. opponere***
convalescere*
subsidere*

37. intervenire**

38. carere**
imminere*

55 verbs

ADVERBS

8. placide*

19. coniunctim*

21. promiscue*

22. accuratius*

25. hinc**
sinistrorsus*

28. studiose*

33. versus

8 adverbs, etc.

BOOK VII

SUBSTANTIVES

2. caerimonia*

3. civis
iussus*

4. patruus*
adversarius*
severitas
delictum*
documentum*

7. supplementum***

8. nix**
sudor*

10. subvectio*
silentium

14. receptaculum*
coniunx*

15. solacium*

17. tenuitas*
indiligentia*
maiestas*
ignominia***
acerbitas*

19. fiducia***

20. proditio***
concessus*
mollities*
sanguis**
solertia*
laqueus*
ferraria*
corium*
pix***

23. linea*

24. materies*
fax*

25. pluteus*
sevum*
gleba*
scorpio**
propugnator*

28. forum*
infans**
seditio*

29. obsequentia*

30. affirmatio*

31. donum*

33. sacerdos*

35. autumnus*
coniectura*

36. incursus*

37. disceptator*

38. mendacium*

39. momentum**

40. fraus*
patronus*

43. compendium*

44. dorsum*

45. mulio*
cassis*
ostentatio**

46. amfractus*
clivus**

47. sonus*
vestis*
pectus*
similitudo**
humerus**

52. licentia*
modestia*
continentia*

60. sonitus*

62. ductus*

63. indulgentia*

66. otium*

67. comitia*

69. fastigium***
maceria**
excubitor*

70. irruptio*

72. commissura*

73. cacumen*
stipes**
cippus*
quincunx*
scrobis**
flos*
lilium*
hamus*
stimulus**

77. consensio*
consobrinus*
mollitia*
stultitia*
imbecillitas*
invidia*
securis*

81. harpago*
tenebrae*

83. pactum*

84. musculus*

85. declivitas*

86. dimicatio*

101 substantives

ADJECTIVES

1. iunior*
urbanus**
clandestinus**

7. provincialis*

14. acerbus*

15. pulcher**
perangustus*

17. infectus**

19. quot*

20. paluster*
vester***

22. usitatus*

23. alternus*

25. dignus*

29. nimius*

30. ingratus*

31. subdolus*
permagnus*

32. regius*

33. detrimentosus*

36. horribilis*

38. nefarius**

39. pravus

47. manipularis**

59. infidelis*

64. contentus*

72. campester

73. teres*
octoni**

74. exterior***

76. communis*

77. iste*
aeternus*
maestus*
librilis*

35 adjectives

VERBS

1. affingere*
recidere*
deposcere*

2. agitare*

3. negotiari***

4. obtestari
desecare*
effodere*

7. antevertere*

8. discutere*

9. pervagari*

10. perpeti*

11. circumvallare
excubare***

14. abundare**
secare*
detractare*

15. dissuadere*

17. apparare***
parentare*

19. interrumpere**
haesitare*
indignari*
exposcere*
condemnare*

20. insimulare***
interrogare*
sufficere*

21. concrepare*
approbare*
22. integere*
23. effarcire*
coagmentare*
explere
destrahere*
24. fumare*
restringuere**
25. deurere*
inspectare*
fungi*
26. peritare*
28. depugnare*
desperare*
29. sanare*
obsistere*
30. consternari*
33. praevertere*
34. devincere*
37. adiudicare*
38. lacrimare*
42. proclinare*
pudere*
43. contaminare*
exterrere**
44. confluere*
45. circumvehere*
mutare*
46. mollire*
praeducere**
conquiescere*
47. canere*
contionari*
prominere*
exceptare*
48. proferre***
praemetuere*
50. exserere*
excidere*
52. advocare*
54. admaturare*
multare*
extorquere*
55. avehere*
corrumpere**
56. abiungere*
replere*
59. acquirere*
60. tumultuare*
62. permiscere*
64. residere*
69. subluere*
72. derivare*
eminere***
73. materiare*
delibrari*
implicare*
induere*
fodere*
stabilire*
exculcare*
infigere*
infodere*
disserere*
74. convehere*
75. confundere*
discernere*
obtemperare*
76. incumbere*
recensere*
77. residere*
exspoliare*
prosternere*
praesepire*
subigere*
iniungere*
82. transfodere*
83. circumplecti*
definire*
85. contegere*
86. succumbere*
accelerare*

111 verbs

ADVERBS

6. recte**
12. obviam**
18. nusquam*
20. fortuito*
22. scienter
24. eminus*
27. aliquando**
28. cuneatim*
35. necubi*
36. nimis*
43. mitissime*
45. tumultuosius*
51. intolerantius*
60. industrie*
70. viritim*
parce*
tantumdem*
76. foris*
77. patienter*
ergo**

20 adverbs, etc.

GENERAL OBSERVATIONS

In considering the vocabulary of the *Bellum Gallicum* as a whole, we are dealing with about twenty-six hundred different words, exclusive of proper names, though this number will vary somewhat according as we include participles, used as adjectives or substantives, under the verbs from which derived, adverbs, formed from adjectives, under the adjectives. Usually, though not always, this has been done in making the above estimate. Of this number seven hundred and eighty-eight are used but once, being distributed as follows: Book I., 122; II., 50; III., 66; IV., 65; V., 135; VI., 129; VII., 221. Further, six hundred and fourteen words occur only two or three times, over two-thirds of these being used but twice. We may, therefore, consider as the working vocabulary of the seven books between twelve and thirteen hundred words.

Now what is the nature of the entire vocabulary? In the first place it is concrete, a feature, indeed, of Latin and Greek writings in general, yet very much more so of Cæsar than of most other authors. In this respect Professor Bennett in *The Teaching of Latin and Greek* draws attention to the marked contrast between Cæsar and Nepos, whose "Lives" are so often recommended either to take the place of, or to precede, the study of Cæsar. Cæsar is not given to character sketches; there is nothing in all the seven books that can be compared, for example, with *Anabasis* I., 9, where Xenophon gives in detail the character of Cyrus, nor even with the shorter sketches of the five generals in *Anabasis* II., 6. The men who figure in the *Bellum Gallicum* are presented to us rather indefinitely; in fact Cæsar had hardly any opportunity to study the character of his enemies and of his own officers he has little to say. The commentaries are chiefly an account of what he himself did, and there is consequently little need for abstracts. To be sure occasional hints of character are given; Dumnorix is spoken of (I., 9), as "cupiditate regni adductus," and again (I., 18), as a man "summa audacia, magna apud plebem propter liberalitatem gratia." In III., 10, Cæsar characterizes mankind in general, "omnes autem homines natura libertati studere et condicionem servitutis odisse." Then, too, when he is speaking of character, he avoids abstract substantives to some extent; it is said (I., 31), that Ariovistus

"superbe et crudeliter imperare . . . Hominem esse barbarum, iracundum, temerarium"; yet in the succeeding chapter a substantive is used to describe the same quality, where Divitiacus says of the Sequanians, "absentisque Ariovisti crudelitatem, velut si coram adesset, horrerent." We learn also from I. 31, the eagerness of Ariovistus for more territory, from I. 34, 36 and 44, his haughty independence, and his treachery from I., 46 and 47. Thus we know considerable about this rather remarkable man, one of the greatest of Cæsar's foreign enemies, yet with the main exception of the passage quoted from I., 31, it is all given us in concrete form. See Chapter IV. for further discussion of Cæsar's delineation of Ariovistus.

Again take Cæsar's principal lieutenant whom he must have known thoroughly, yet how little he has to say about him! We know he is a man of considerable ability because of the confidence Cæsar has in him and of the masterly way in which he conducts himself in the field and camp, as in I., 21 and 22, where we see also his perfect obedience to commands, the first duty of the true soldier. He knows what to do in an emergency, as in the battle with the Nervians (II., 26), when his timely action saved the day. His strategic power is brought out in his successful campaign against the Treverians (VI., 5-8), and again (VII., 60 and 61) in the vicinity of Metiosedum. Once (VII., 34) he successfully commands four legions. Though from these and similar references we may gather a few facts regarding his character as a commander, Cæsar says not a word directly on this point, and gives us nothing at all concerning him as a man. Vercingetorix, against whom Cæsar found his fiercest fighting, is mentioned (VII., 4) as "summæ potentiæ adulescens," and in the same chapter we have "summæ diligentiæ summam imperi servitatem addit." These are the only direct references to his character, though the longest of the seven books is devoted to the campaign against him.

The same thing we find true of the other friends and enemies of Cæsar who are prominent in the war. Cotus (VII., 32) is a man "summæ potentiæ et magnæ cognationis:" in Divitiacus Cæsar recognizes (I., 19) "egregiam fidem, iustitiam, temperantiam;" Piso, the Aquitanian (IV., 12), is "vir fortissimus" (The noun *vir*, by the way, it may be interesting to know, occurs only ten times in the *Bellum Gallicum*, and not at all until II., 25).

Gaius Volusenus is described (III., 5) as "et consili magni et virtutis;" Procillus (I., 47), as "summa virtute et humanitate" and is called (I., 53) "hominem honestissimum provinciæ Galliæ." Examples might be multiplied, but these are perhaps sufficient to show Cæsar's habit of portraying individual men, by just a phrase or two. Nowhere is there anything that might be called a character sketch, and for this reason and because he is writing of what is, for the greater part, action, there is little need of abstract ideas. As would naturally be expected, therefore, substantives of this sort are comparatively uncommon; one hundred and seventy-five words would comprise all the real abstracts used, and very many of these occur only three times or less. Of course, this does not include such nouns as *excursio, oppugnatio, obsessio, expugnatio,* etc., which, though sometimes to be taken as abstracts, are employed by Cæsar with few exceptions in a concrete sense.

Let us now examine more in detail the substantives of the *Bellum Gallicum* and see from what declensions they come. Altogether there are a few over nine hundred, of which the third declension has nearly four hundred, the second not far from two hundred and fifty, the first one hundred and seventy, the fourth eighty-six, and the fifth eleven, as follows: *acies, dies, fides, materies,* meridies, mollities,* pernicies,** planities, res, species* and *spes,* three of these being used only twice or once as marked. There are also four indeclinable words, *fas* (I., 50; V., 12; VI., 14, 23), *nefas* (VII., 35); *instar* (II., 17), and *opus* (*est*); or five, including *nihil,* which, though it appears eight times with the ending *o* (I., 5, 49; IV., 17; V., 4, 7, 55; VII., 53, 64), is nevertheless usually regarded as indeclinable. Only two masculines of the first declension appear, *auriga* (IV., 33) and *nauta* (III., 9 and V., 10). In the second declension two feminines — names of trees — are found, *fagus* (V., 12), and *taxus* (VI., 31), and one neuter ending in *us, vulgus,* with accusative in *us* (I., 46), though in VI., 14, Holder gives the accusative as *vulgum,* as do also Harper and Tolman, and Sihler in his *Lexicon to Cæsar's Gallic War.* Manuscripts vary, but Meusel in his *Lexicon Cæsarianum* prefers *vulgus. Locus* invariably has the neuter form in the plural, since it always refers to localities (*loca*), and not to passages in a book or topics (*loci*). Of the eight principal feminines of the fourth declension, *acus, domus, Idus, manus, penus,*

porticus, quinquatrus and tribus, only *domus* and *manus* are used. Substantives allowing only *-ubus* in the dative and ablative plural are entirely lacking, while of those which may have either *-ubus* or *-ibus,* only *lacus* (not used in the plural) and *portus* (always with *-ibus*) occur. The ending *-u* for the dative singular is poetical in classic prose yet Cæsar has (VI., 42), *casu.* Some manuscripts give *casui* and Allen and Greenough print it so, though Meusel has *casu* (*casui* — *codex Parisinus* I.). One manuscript also gives *exercitu* (VI., 44) as dative.

Cæsar is preëminently a man of action. He sees a thing to be done and wastes no time in doing it. He learns, for example (I., 38), that Ariovistus is hurrying to seize a very important town of the Sequanians and immediately "huc Cæsar magnis nocturnis diuturnisque itineribus contendit." This, with the remainder of the same sentence, "occupatoque oppido ibi præsidium conlocat," illustrates a marked characteristic of his style; for, as he is quick in his movements, when he comes to tell about them, he is short and concise. "Details to which we would assign a paragraph are crammed into an adjective or a participle."* This cramming of details is well exemplified in that famous sentence (II., 25), in which one hundred nineteen words, eighty-four of them different, separate the subject from the verb. This same sentence, which continues for two more clauses and constitutes all but three lines of a chapter of nineteen, illustrates one further point, his nice choice of words. Though the whole vocabulary, as is natural in a military treatise, is somewhat limited as to the subject matter, within that range the choice is large and very carefully made. Within the one period mentioned we have about one twenty-sixth of the whole number of different words used in the *Bellum Gallicum* and each word has a purpose, adding something definite to the picture.

As might be expected in a work so full of action, verbs abound, forming nearly half of the working vocabulary, and almost two-fifths of the whole vocabulary. They are divided among the different conjugations as follows: nearly five hundred in the third, a little less than three hundred and fifty in the first, about a hundred in the second, forty-eight in the fourth and thirty-

* See "Warfare and Writing of Cæsar," Atlantic Monthly, Vol. XLIV, 273.

nine irregulars, the whole number in the third conjugation as in the third declension of substantives being by far the most numerous. The following verbs of the first conjugation which form their perfect and supine irregularly are found: *dare,* common; *iuvare,* six times; *necare,* six times (it has also the regular forms and so occurs in III., 16); *secare,* once only (VII., 14); *stare* in V., 35, 43 and VI., 13, 27, though *constare* occurs fourteen times and *distare,* five; *vetare* in II., 20; V., 9; VII., 33. Of the few in the second conjugation which have in the perfect *-evi* and supine *-etum,* Cæsar uses *delere* six times; *flere,* six times but only in the present participle; *complere,* often; *explere,* six times but all in the seventh book; *replere,* once (VII., 56). The four semi-deponents all appear though only *audere* is common in the simple form; *gaudere* is used only once (V., 12); *solere,* but twice (VI., 15 and VII., 35); and *fidere,* only in its compounds *diffidere* (V., 41 and VI., 36, 38) and *confidere* (often). *Reverti* which properly belongs in this class is also common. The three compounds of *legere* which have *-lexi* in the perfect are used; *diligere* in VI., 19; *intellegere,* often; *neglegere,* in all books except the second. The following compounds of *facere* which retain the *a* and have *-fieri* in the passive are found: *commonefacere* (I., 19), and *satisfacere* (six occurrences), of which the passives are not used in the Gallic War; *mansuefieri* (VI., 28), and *patefieri* (II., 32, III., 1, VII., 8), of which the actives do not occur; and *insuefacere,* found only in the perfect participle. Contrary to the rule for compounds of *facere* which change *a* to *i*, *conficere* has in the passive *confieri* (VII., 58), though *confici* also occurs (VIII., 28, VI., 34). Of the thirty-nine irregular verbs (*mansuefieri* and the list on p. 409 of Harper and Tolman's edition, 1891), we find each used four times or more except the following: *abire* (VI., 43; VII., 50); *anteferre* (V., 44 [2]); *coire* (VI., 22); *introire* (V., 43); *malle* (III., 8, 20); *mansuefieri* (VI., 26); *patefieri* (see above); *proferre* (VII., 48, 82, 84); *prodesse* (VI., 40) and *transferre* (V., 3, 13; VII., 8). Deponent verbs are of frequent occurrence, nearly half of the whole number belonging to the first conjugation, eight to the second, ten to the fourth and the remainder to the third, making nearly a hundred altogether.

Now of adjectives and adverbs, Cæsar employs nearly six hundred in the *Bellum Gallicum,* of which about one half are

in the working vocabulary. In general, though not always, both in this estimate and in the lists above, adverbs formed regularly from adjectives, and the accusative or ablative of adjectives used as adverbs have been included under adjectives. Here are a few exceptions: *aegre,* common; though the adjective *aeger* occurs only three times; *facile,* quite frequent, though *facilis* is found but seven times; *acriter, audacter, diligenter* and *male,* of which the coresponding adjectives do not appear. Of the third declension adjectives of three terminations (seventeen in all, including the names of the last four months), the following are used: *alacer, campester* (in VII, only), *celer, equester, paluster* (VI., 20), *pedester* and *silvester.* The only indeclinable adjective found, and that not until the fourth book is *necesse,* unless indeed we include *mille.* The comparative and superlative degrees of both adjectives and adverbs are rather numerous, the superlative of adjectives and the comparatives of adverbs being somewhat in the majority. Of adjectives irregularly compared, all appear except *malus* (used only in the adverbial form), *frugi* and *nequam;* and of adverbs, the following: in positive only, *nuper* and *satis;* comparative only, *potius* and *secius;* positive and comparative, *saepe;* comparative and superlative *magis, maxime;* in all three degrees, *diu* and *parum.*

Finally prepositions and conjunctions are represented by some seventy words, only eight being used less than four times. Among these, those construed with the accusative are *ad, ante, apud, adversus* (IV., 14 only), *circum, cis, citra, contra, inter, intra, ob, penes,* (in VII., only), *per, post, praeter, propter, secundum, trans* and *ultra;* with ablative, *ab, cum, de, ex* (generally in this form before both vowels and consonants), *sine, pro* and *prae* (II., 30; VII., 44); with accusative and ablative; *in* and *sub.* The following are sometimes postpositive in the *Bellum Gallicum,* principally with the relative: *cum, de, ex* and *inter* (VI., 36); *versus* is always so and *in* or *ad* precedes the noun (except VII., 61; VI., 33, VII., 7, 8).

Subordinate clauses are introduced by these words: Casual, *cum, quod* and *quoniam,* but not *quia* nor *quando* (found once, III., 12, but as an adverb).

Temporal: *cum, cum primum, ubi, postquam* and *priusquam,* but not *antequam; simul* (VI., 26), *simul atque* (III., 5; IV, 27; VII., 12), *quotiens* (V., 34; in I., 43, it introduces an indirect

question), *quamdiu* (I., 17), *dum* and *quod* (IV., 11, 12; V., 17, 24), but not *donec*.

Concessive: *etsi, tametsi* (I., 30; V., 34; VII, 43, 50), *quamvis* (IV., 2), *cum* and *ut* (III., 9).

Conditional: *si, sin* (I., 13; V., 35), *nisi, quod si* (I., 40), *si modo* (IV., 20, V., 31).

Comparison: *ut, uti, sicut, sicuti* (V., 17, 43, 51; V., 19), *velut si* (I., 32), *quasi* (VII., 38), *atque* (e. g. II., 19), *quam*.

Indirect questions: *an, cur, si, utrum, unde* (V., 53).

We have to observe that of the working vocabulary the following words are used in the first two books: a few more than three hundred substantives, almost exactly four hundred verbs, some two hundred and fifty adjectives and adverbs and between sixty and seventy prepositions and conjunctions, over a thousand in all, or about five-sixths of the whole number. The importance will therefore be seen of the pupil's getting these at least well in hand in order to facilitate his further study.

A word in conclusion as to which book, from the standpoint of vocabulary, it is better to read first in commencing the study of Cæsar. If the pupil begins with the second, as is so often done now, he will have in hand at the end, seven hundred and thirty-four different words; at the end of an equal number of chapters of the first book, seven hundred and forty-nine words; while the whole first book will give him nine hundred and twelve. The question now resolves itself into this; is it better, owing to the extra syntactical difficulties of the first book, to come to it fairly well equipped as to vocabulary, or shall we by reading the first book at once get familiar with the tools, as it were, and so be ready to take up and enjoy the remaining books? This is a question which will depend for its solution somewhat on the particular pupils to be dealt with and must be left for each teacher to decide. For a further discussion of this question see chapter I., p. 7.

III

STUDIES IN THE SYNTAX OF CÆSAR'S GALLIC WAR

By WILLIAM F. LITTLE

In most of the editions of Cæsar that are upon the market the syntactical points are treated as occasion demands in the commentaries, but there is no systematic attempt to gather together into groups the prominent features of Cæsar's syntactical usage for the purpose either of comparison or summary. And it seems unquestionably true that the majority of the teachers of Cæsar are not equipped with the knowledge of the peculiarities of Cæsarian usage which would seem to be requisite for proper interpretation of the text. If this statement may seem to be too strong, a few questions put to the ordinary teacher of Cæsar would prove the point. Such questions, for example, as: Wherein do the constructions of Cæsar differ from those of Cicero? What constructions follow the verbs *postulare, flagitare, petere, implorare, quaerere, antecedere, convenire, obire, subire, praecedere, submittere, inferre?* Does Cæsar use a preposition after *discedere* or *excedere?* In how many different ways does Cæsar employ the preposition *ex* or *ab?* What are the uses of *cum* with the ablative? To what extent does Cæsar use the subjunctive? What does Cæsar show in regard to the sequence of tenses? By such questions as these the truth of the foregoing statement can be incontrovertibly established. Experience teaches that specific knowledge is wanting. Hence we often meet the rather peculiar phenomenon of a teacher trying to teach something that he does not know fully himself; and, as a result, it frequently happens that pupils read their Cæsar and pass on to the next year without having gained very much accurate information. They are not at all sure, for example, of a partitive genitive, or what construction follows *iubere* or *imperare.*

In the following pages an attempt is made to set forth the constructions of Cæsar as fully as possible in order that the teacher may see just what there is to learn and what he should emphasize in the daily recitation; for success in teaching very frequently depends upon the knowledge of what points should be emphasized and what points should be passed over. To do this, of course, requires a due proportion of good judgment and common sense, but above all, an exact knowledge of the usage of the author.

The statistics and main divisions in the following study are based upon a book by Heynacher, entitled "Was ergiebt sich aus dem Sprachgebrauch Cæsars im *bellum Gallicum* für die Behandlung der lateinischen Syntax in der Schule?" Second Edition, Berlin, 1886.

THE ACCUSATIVE

1. Many verbs which are transitive in Latin are intransitive in English, and others which are transitive in English are intransitive in Latin.

In Cæsar's usage the following is noteworthy:

Deficere in the sense to "fail" or "give out" is construed variously. It takes the accusative, and may be used either transitively (II, 10, 4; III, 5, 1; V, 33, 1; VII, 50, 6) or intransitively (IV, 20, 1; VI, 16, 5; perhaps VII, 30, 1). In the sense to "revolt from" it is an intransitive verb, and is followed by *ab* with the ablative. It might be advisable to have pupils commit to memory such expressions as "frumentum exercitum deficere coepit," and "milites ab exercitu deficere coeperunt."

Fugere and its compounds occur 5 times as transitives: "fugere" VII, 30, 1; "defugere" VI, 13, 7; "effugere" IV, 35, 1; V, 8, 4; VI, 30, 2. "Fugere" is also frequently used intransitively, for example, I, 53, 1; II, 24, 4.

Aequare occurs but twice and then in the passive: I, 25, 1; VI, 22, 4.

2. The *accusative with compounds.*—The accusative is found 79 times with verbs compounded with *circum, per, praeter* and *trans.* The simple verbs are as a rule intransitive, but become transitive when compounded. The statistics are: "transire" 38

times; "circumsistere" 8 times; "circumvenire" in the active 4 times, in the passive 20 times. Sometimes we find transitive verbs compounded with *trans;* in that case Cæsar frequently uses two accusatives. For example: "transportare" IV, 16, 6; "traducere" II, 5, 4.

With *traducere* we frequently find one accusative, as in I, 13, 1; I, 35, 1; and we find the preposition *trans* repeated in I, 35, 3.

3. The *accusative of extent* in time in answer to the question "how long?" occurs 37 times.

The accusative of extent in space in answer to the question "how far?" "how high?" "how wide?" "how deep?" occurs 38 times.

The accusative of extent in degree occurs 52 times, as follows: "multum" 11 times; "plus" once, I, 17, 1; "plurimum" 13 times; "paulum" 16 times; "nihil" 10 times; "nonnihil" once, III, 17, 5.

Interesting also is the curious sentence IV, 1, 8: "Suebi maximum partem lacte vivunt."

Notice also the accusative of extent with the adverb *longe,* in V, 47, 5 and VII, 16, 1.

The accusative of extent is one of the most dificult constructions for beginners to grasp. Indeed some grammarians call it the idiomatic accusative; hence the importance of emphasizing the usage to the class. As it occurs 52 times in Cæsar, pupils should become familiar with it, and be fully prepared for the "nihil" in the opening paragraph of Cicero's invective against Catiline.

4. The construction of the *double accusative* occurs 70 times, and offers no particular difficulty. Cæsar's use after verbs meaning to "appoint," "make," "consider," etc., follows in the main the rules given in the school grammars. See, for example, IV, 21, 7: "quem regem constituerat"; and VII, 63, 6: "Vercingetorigem probant imperatorem."

But there are cases of two accusatives where some authorities are inclined to call one of them the appositive. These are after such verbs as: "poscere" I, 31, 12; "mittere" I, 7, 3; "abducere" II, 5, 1; "redigere" II, 27, 5; IV, 3, 4; "relinquere" II, 29, 4; III, 1, 6; IV, 37, 1; VII, 46, 3; and "reddere" II, 5, 5.

After the expression *certiorem facere*, which occurs 6 times, Cæsar uses the ablative with *de* but never the genitive. Note particularly VII, 87, 5: "Caesarem per nuntios facit certiorem."

In the passive *certiorem fieri* occurs 18 times.

Facere is used with other adjectives in I, 36, 4; IV, 3, 4; V, 1, 2.

It is interesting to note that the person by whom one is informed is given by *ab* or *per*. The distinction seems to be as follows: — *Per* is never used for single persons, and is always applied to those through whose instrumentality a distant person conveys information; while with *ab* the person conveys the information personally. Thus: Cæsar was informed *per exploratores* means that the information came through scouts but they did not communicate to him in person; but Cæsar was informed *ab exploratoribus* means that Cæsar was informed by scouts in person. For the use of *ab* in this connection see II, 34, 1; III, 9, 1; II, 10, 1; V, 53, 6; I, 21, 1; I, 41, 5; VI, 10, 1; V, 47, 1; V, 25, 5. For *per* see I, 12, 2; III, 2, 4; IV, 4, 6.

An interesting example also is V, 17, 3: "hostes praecipites egerunt"; where the adjective is predicate.

Noteworthy also is the passage II, 5, 5: "post eum quae erant tuta ab hostibus reddebat," where the place of the predicate substantive in the second accusative is taken by an adjective.

5. *Domum* occurs as the *terminal* accusative 12 times.

Domum and *domos relinquere* are found once each, namely, I, 44, 2; I, 30, 3. The other forms *domo* and *domi* occur 9 times and 7 times respectively.

6. It is noteworthy that certain transitive verbs such as *cognoscere, desperare,* etc., are used with the preposition *de* instead of with the object accusative. Thus we find "desperare de salute," instead of "desperare salutem." This occurs 25 times.

7. *Inire consilium* occurs 14 times; *inire gratiam* only once. While the passive use of the participle occurs 7 times.

Adire is another case of a verb compounded with *ad* that is not followed by the dative. It takes the accusative 10 times in such expressions as: "adire finis, civitatem." It also occurs without any object in the sense of to "advance," VI, 6, 1. It occurs twice with *ad,* namely, IV, 2, 5; VI, 18, 3.

8. *Verbs of asking* show a varied usage — "petere ab ali-

quo aliquid" is found 9 times. The verb occurs frequently, however, with the simple accusative, for example, I, 27, 2; I, 31, 4. Often instead of the accusative we find a substantival clause introduced by *ut* or *ne,* as in I, 19, 5; I, 28, 5.

"Quaerere ex aliquo aliquid" occurs 6 times, and "quaerere ab aliquo aliquid" 3 times.

"Postulare ab aliquo aliquid" is found twice, namely, I, 34, 1; I, 35, 2.

"Desiderare ab aliquo aliquid" twice, namely, VII, 20, 7; VII, 52, 5.

"Repetere ab aliquo aliquid" twice, namely, I, 30, 2; V, 49, 2.

"Flagitare aliquem aliquid" once, I, 16, 1.

"Implorare ab aliquo aliquid" once, I, 31, 7.

"Reposcere ab aliquo aliquid" once, V, 30, 2.

On the other hand, *poscere* occurs with the simple accusative in II, 15, 1; I, 27, 3; and with the appositive accusative I, 31, 12; "poscere liberos . . . obsides."

"Insistere rationem pugnae" is an interesting structure in III, 4, 1.

9. Idiomatic constructions are "propius movere" or "accedere aliquem" or "aliquid," which are found 6 times, while "proximus" with the accusative occurs twice, namely, III, 7, 2; I, 54, 1.

10. Transitive verbs compounded with *trans* are followed by two accusatives 7 times. See, for example, VI, 3, 4; IV, 16, 6.

11. "Queri aliquem rem" is found 4 times, namely, I, 20, 6; I, 39, 4; VI, 42, 1; VII, 63, 8.

12. "Subire tectum, periculum, condiciones pacis" are found 5 times.

13. "Id contendo" appears I, 31, 2; IV, 17, 12.

14. "Antecedere aliquem" in the sense of to "surpass" or "excel" any one is found twice, namely, III, 8, 1; VII, 5, 4. In the sense to "precede" any one also twice, namely, IV, 11, 2; VII, 12, 4.

"Praecedere aliquem virtute" occurs in I, 1, 4. It is especially worthy of note that neither one of these two verbs is followed by the dative in Cæsar.

"Convenire aliquem," to "meet any one," occurs I, 27, 2.

And finally "quos ille edocuerat" is interesting in VII, 38, 4, with which should be compared VII, 19, 4.

15. The following uses of the accusative are not found in the *Bellum Gallicum:* — the cognate accusative; two accusatives with *docere, edocere, celare;* two accusatives with *moneo, hortor;* accusatives with impersonal verbs, *decet, dedecet,* etc.; accusative of time with *abhinc;* accusative with *natus* or *maior natu.*

Conclusions

16. In the teaching of the accusative it is evident, from what goes before, that the most important constructions occur with sufficient frequency to make it next to impossible for the student to fail to grasp them; particularly is this true of the accusative of extent, which occurs for the first time, as we have seen, in I, 17, 1.

Next in order is the construction with verbs of asking and demanding. And in the case of these verbs pupils should be taught not merely to distinguish the meanings of the verbs, but should also be reminded that they are not always followed by two accusatives, one of the person, the other of the thing, as some beginners' books are wont to state. Cæsar shows many variations in his construction of these verbs, and affords plenty of opportunity for practice.

In the case of those constructions which occur but once, it hardly seems worth while to burden the student's mind with them.

THE GENITIVE

17. The most important category of the genitive case is the *partitive genitive;* this occurs some 366 times, divided as follows:

The partitive genitive with substantives that denote a part or measure is found 200 times; with *milia* 70 times; with other numerals and words indicating number 24 times.

Mille is adjectival in I, 22, 1; VII, 46, 1; and VII, 49, 1. In I, 25, 5, the reading is doubtful. *Mille* is used in apposition in VII, 64, 1. It is construed with the genitive but also modified by another word in I, 49, 3 (expedita); so also *armata* in II, 4, 5; II, 4, 8; and V, 49, 1. In IV, 1, 4 we have the phrase "singula milia armatorum."

Uterque is an adjective in Cæsar, and found with the substantive some 18 times. Compare II, 16, 2, "his utrisque finitimis," and IV, 17, 6, "haec utraque." With the genitive it is found but once, VII, 32, 4, "uterque eorum."

The partitive genitive occurs with the neuter of adjectives used substantively and pronouns 56 times, divided as follows: — with *quid* 16 times; with *nihil* 10 times; *quantum* 7 times; *tantum* 4 times; *quicquam* 4 times; *quod* 4 times, as follows: III, 16, 2; IV, 22, 3; V, 2, 3; VII, 55, 8; *aliquid* 3 times, namely, III, 16, 2; IV, 32, 2; V, 29, 1; *aliquantum* V, 10, 2; *id* VII, 5, 5 ("quibus id consilii fuit"); *hoc* VII, 15, 2 ("hoc sibi solaci proponebat"); *quidquid* VII, 46, 2; *multum* V, 22, 4; *plus* I, 20, 2; *minus* I, 14, 1 and V, 27, 3.

The partitive genitive occurs with comparatives twice, namely, VI, 9, 7; VII, 72, 3.

The partitive genitive occurs with superlatives (including "plurimum totius Galliae posse" (I, 3, 6; V, 3, 1) 13 times.

The partitive genitive with an adverb occurs but once, "satis esse causae" I, 19, 1. The partitive genitive is never used in Cæsar with adverbs of place.

18. The *objective genitive* exclusive of gerunds occurs some 200 times, and follows in the main the treatment in the school grammars.

19. The verbs of *remembering* and *forgetting* are found only in I, 13, 4; I, 14, 3; VI, 38, 1; VII, 34, 1.

20. We do not find in the *Bellum Gallicum* the participles of the following verbs with the genitive: *piget, pudet, taedet, miseret;* but *paenitet* occurs with the genitive once, IV, 5, 3.

21. The *genitive of quality* is found 82 times.

22. The genitive of the gerund and gerundive after substantives occurs 72 times; after *causa* and *gratia* 54 times.

23. The genitive of a substantive after *causa,* "on account of," is found 37 times.

24. The *genitive with adjectives* occurs as follows: — *peritus* 3 times; *imperitus* 6 times; *cupidus* 4 times; *insuetus* twice; and *planus* and *conscius* once each.

25. The *predicate genitive* after *esse* in the sense "it is the duty of," "the custom of," etc., is found 12 times, as follows: I, 41, 3; I, 45, 1; IV, 5, 2; IV, 13, 2; IV, 16, 4; IV, 17, 1; V, 7, 8; V, 34, 1; VI, 30, 2; I, 21, 2; VI, 7, 8; VII, 77, 12.

26. The *epexegetical genitive* often supplies the place of an appositive; thus in V, 47, 5, we find: "copiae equitatus peditatusque," meaning "troops," namely, cavalry and infantry; and similarly in VI, 7, 1; VI, 10, 1; VII, 5, 3; VII, 65, 1; VII, 76, 5; with which should be compared III, 10, 2; III, 8, 2.

27. The genitive with neuter adjectives of the second declension is found 4 times: "quantum boni" I, 40, 6; "sui nihil" I, 43, 8; "novi aliquid" VII, 12, 6; "certi aliquid" VII, 45, 4; *medius* is followed by the genitive 3 times, namely, I, 34, 1; IV, 19, 3; VI, 13, 10.

28. The genitive occurs with *interesse* three times, namely, II, 5, 2; V, 4, 3; VI, 1, 3.

29. The *genitive of price* occurs twice, I, 20, 5; IV, 21, 7.

30. The *genitive of the charge* occurs twice, namely, VII, 2, 1; VII, 38, 2. Compare "summae inequitatis condemnari" VII, 19, 5.

31. Interesting is "nihil ad celeritatem sibi reliqui fecerunt" in II, 26, 5.

32. The genitive is not used where one might expect it in I, 40, 12: "avaritiam esse convictam," and the phrase "complures nostri milites" in I, 52, 5; IV, 12, 2; VII, 47, 7; VII, 62, 1.

Conclusions

33. In the teaching of the genitive case the most important thing for the teacher to be sure of is that his pupils understand thoroughly the partitive genitive in its manifold uses. Next to this, the genitive with adjectives and the predicate genitive with *esse* should be carefully taught. It is noteworthy that out of the nearly nine hundred cases of the genitive in Cæsar, more than one-third is occupied by the partitive genitive, and the objective genitive comes second with two hundred cases. It is obvious therefore that Cæsar furnishes plenty of material for the study of the genitive. In the material of the genitive with adjectives the pupils' attention should be directed to the dative with adjectives at the same time, so that the distinctions may be clearly grasped.

The predicate genitive with "esse" is idiomatic, but affords no particular difficulty.

THE DATIVE

34. *Dative with compounds.* — The most important category of the constructions of the dative is the dative with verbs compounded with *ad, ante, con, in, inter, ob, post, prae, sub, super.* This occurs 225 times. Of these verbs the following are the most important: "appropinquare" 11 times, "occurrere" 10 times, "subvenire" 5 times, "succurrere alicui" twice, "obicere aliquem alicui rei," I, 43, 7; V, 13, 6.

The others in the order of frequency are "praeficere aliquem alicui rei" (V, 9, 11, "praesidio navibus") 20 times.

"Inferre bellum alicui" 10 times; "calamitatem alicui" I, 12, 6; II, 4, 4; "iniuriam alicui" I, 14, 6; II, 32, 2; "spem alicui" II, 5, 3; "periculum alicui" V, 16, 3; "terrorem alicui" VII, 8, 3; "ignem alicui" VII, 22, 4.

"Praeesse exercitui, civitati," etc., 17 times.

"Accidit aliquid alicui" 13 times.

"Submittere aliquem alicui" 7 times.

"Committere vitam alicui" V, 43, 6; "suam salutem alicui" VII, 6, 4; VII 21, 3; "se barbaris alicui" IV, 21, 9; "aliquid alicui" IV, 5, 1.

"Offerre se alicui" VI, 89, 2; "se morti" VII, 77, 5; "se hostibus" IV, 12, 6; "spem alicui" VI, 34, 2; "beneficium alicui" VI, 42, 3.

"Succedunt recentes defessis" V, 16, 4; VI, 25, 1; VII, 42, 2; VII, 85, 5.

"Adiungere sibi" III, 2, 5; VI, 2, 2; VI, 12, 2; VII, 4, 6.

"Subicere Galliam servituti" VI, 77, 9; "navigationem hiemi" IV, 36, 2; "subiectum esse imperio" p. R. VII, 1, 3; "securibus" VII, 77, 16.

"Affert aliquid alicui" I, 53, 6; VII, 10, 1; V, 54, 4.

"Inicere alicui metum" I, 46, 4; IV, 19, 4; "alacritatem" VII, 55, 9.

"Constat aliquid alicui" III, 14, 3; IV, 29, 4; VII, 5, 6.

"Addere aliquid alicui" VII, 4, 9; VII, 41, 4; VII, 45, 3.

"Obvenit aliquid alicui" II, 23, 1; VII, 28, 6; VII, 81, 6.

"Interesse proelio" IV, 16, 2; "rebus divinis" VII, 87, 5; VI, 13, 4.

"Adsciscere sibi socios" I, 5, 4; III, 9, 10.

" Consciscere sibi mortem " I, 4, 4; III, 22, 2.

" Constituere poenam," etc., VI, 17, 5; " alicui " VII, 71, 6.

" Imponere stipendium victis " I, 44, 2; I, 45, 2.

" Intercedunt " I, 43, 6; V, 11, 9.

Of those that occur but once the following seem to be worthy of mention:

" Accessit Remis studium," etc., II, 7, 2. " Adesse alicui " VII, 62, 5. " Antepono " IV, 22, 2. " Antevertendum consiliis " VII, 7, 3. " Praevertendum huic rei " VII, 33, 2. " Comparaverat sibi " V, 55, 4. " Contigisse paucis " I, 43, 4. " Evenit legioni " IV, 25, 3. " Iniungere his " VII, 77, 15. " Innata est," " illi generi " VII, 42, 2. " Insistere iacentibus " II, 27, 3. " Interponere alicui " V, 6, 6. " Praeferre se alicui " II, 27, 2. " Praeferri . . . omnibus " V, 54, 5.

35. The next category of importance is the *dative for which*, that is, to indicate the purpose or end, of which Cæsar shows 88 cases. This dative is used with such verbs as: *esse, relinquere, deligere, mittere, venire, constituere, dicere, submittere*, etc., but not *habere*.

36. This dative may be further classified as follows:

First, the dative with *esse*.

" Usui esse " 12 times, as the passive of *utor*.

" Mihi curae est aliquid " I, 33, 1; I, 40, 2.

" Alicui impedimento " I, 25, 3; II, 25, 1; " testimonio " V, 29, 4; V, 52, 4; VI, 28, 3; " saluti " V, 44, 14; VII, 50, 6; " ornamento " I, 44, 5; VII, 15, 4.

Once each: " esse auxilio contemptui " II, 30, 4; " cordi " VI, 19, 4; " documento dolori " V, 29, 3; " subsidio terrori " VII, 66, 6.

The idiom *mihi est nomen* with the dative does not occur.

Noteworthy is " relinquere aliquem castris praesidio " 11 times, and " deligere locum castris, domicilio " 10 times.

" Mittere aliquem subsidio " 8 times.

" Venire alicui auxilio " 5 times.

" Constituere diem pugnae " 4 times.

" Submittere aliquem subsidio " V, 58, 5; VII, 81, 6.

" Dicere diem colloquio " I, 42, 3. " Castris oppugnandis " V, 27, 5.

The following verbs occur once each with the dative of purpose or end: " arcessere " III, 11, 2; " ducere " II, 8, 5; " abdu-

cere" VII, 87, 2; "praeficere" V, 9, 1; "dimittere," VI, 8, 5; "ire" VII, 62, 8; "petere" IV, 12, 1; "succurrere" VII, 80, 3; "destinare" VII, 72, 2; "canere receptui" VII, 47, 1; "adhibere consilio" VI, 13, 1.

37. The *dative with adjectives* offers no particular difficulty. It occurs some 63 times with adjectives of "likeness," "fitness," "nearness," etc. But care should be taken that pupils do not confuse these adjectives with adjectives which are used with the genitive.

38. For the dative of *advantage* or *disadvantage* Heynacher gives no figures, merely saying that it occurs frequently. It is not particularly difficult, and the following examples may serve to show its use:

"Exercitui" V, 20, 4; "sibi" II, 4, 5; II, 11, 1; "sibi praestare" II, 31, 6; "Labieno fieret" V, 53, 1; "sibi reliquit" VII, 34, 2; "huic rei reliquit" V, 2, 3; "expedito patet" VI, 25, 1.

39. The *dative of the agent* with the gerund or gerundive, instead of the ablative with *ab,* occurs 26 times. With the perfect passive participle it does not occur.

40. The *dative of possession* with *esse* occurs 18 times.

41. The constructions of "persuadere" are interesting; they occur 18 times as follows: I, 2, 1; I, 2, 3; I, 3, 4; I, 5, 4; I, 6, 3; I, 9, 2; I, 40, 3; II, 10, 5; II, 16, 2; III, 2, 5; III, 18, 2; V, 29, 5; V, 31, 6; V, 38, 4; V, 45, 3; V, 48, 3; V, 55, 2; VI, 14, 5; VII, 20, 3.

42. Notice also the constructions of "studere," of which there are 14 cases as follows: "novis rebus studere," 3 times, I, 9, 3; III, 10, 3; IV, 5, 1; the other cases are II, 1, 3; II, 17, 4; VII, 14, 2; VII, 20, 5; VI, 22, 1; VI, 29, 1; VI, 14, 4; VI, 21, 1; VI, 21, 3; VII, 28, 3; VII, 4, 8.

43. The dative is used with *consulo* (9), *prospicio, provideo* 12 times.

"Facere alicui bellum" twice, IV, 22, 1; V, 28, 1; "alicui potestatem" I, 50, 1; IV, 11, 2; IV, 15, 4; "alicui copiam" I, 28, 3; "alicui fidem" IV, 11, 3; "alicui finem" I, 33, 1.

"Parcere alicui" V, 36, 1; V, 40, 7; VI, 9, 6; VI, 28, 1; VII, 28, 4; VII, 47, 5.

The *ethical dative* is found as follows: I, 3, 3; I, 5, 3; I, 28, 1; I, 36, 3; I, 44, 7; VII, 52, 1.

44. The following less common constructions are noteworthy:

To fear for any one occurs 5 times: *timeo* (3); *praemetuo* (1); *vereor* (1).

"Dicto audientem esse" I, 39, 7; I, 40, 12; V, 54, 3; "alicui audientem esse" I, 40, 12.

"Locus relinquitur virtuti" V, 35, 4; "parvulo detrimento" V, 52, 1; (VI, 42, 1).

The dative after *desperare* III, 12, 3; VII, 50, 4.

"Fidem habere alicui" I, 19, 3; I, 41, 4.

"Hostibus in contemptionem venire" twice.

"Dicare se alicui" VI, 12, 7; VI, 13, 2.

"Magnos sibi spiritus sumere" I, 33, 5; II, 4, 3.

"Servire rumoribus" IV, 5, 3; "servire bello" VII, 34, 1.

"Diffidere alicui rei" V, 41, 5; VI, 32, 2.

"Reperire salutem alicui" I, 53, 2; III, 15, 2.

45. Single constructions occur as follows: "praestare alicui aliqua re" I, 2, 2; "praesto esse alicui" V, 26, 2; "praestate eandem nobis virtutem" VI, 8, 4; "in fuga sibi praesidium ponere" II, 11, 5; "probat illis" I, 3, 6; "militibus spem minuere" V, 33, 5; "bellum alicui parare" V, 56, 1; "gratiam alicui habere" VII, 20, 6; "mederi alicui rei" V, 24, 6; "suae virtuti invidere" II, 31, 5; "favere et cupere Helvetiis" I, 18, 8; "canere receptui" VII, 47, 1; "licere illis discedere"; "quibus licet esse"; "pugnando parem esse"; "obviam proficisci alicui" VII, 12, 1; "communi saluti non deesse" V, 33, 2; "petere diem indutiis" IV, 12, 1; "natum esse imperio" VII, 37, 2; "donare alicui aliquid" VII, 11, 9 (but "donare aliquem aliqua re" I, 47, 4); "condonare alicui aliquid" I, 20, 5; "cedere fortunae" VII, 89, 2; "concedere Suebis" IV, 7, 5 (cf. Liv. XXIII, 4, 1). "Romanis de muro manus tendere" VII, 48, 3; "diem dicere alicui" V, 37, 2; "homo plebi acceptus" I, 3, 5; "victoria sibi explorata" VII, 20, 7.

Conclusions

46. The dative occurs in Cæsar only about 550 times; less frequently, that is, than any of the other cases. It is preëminently a case of the indirect object and follows, in the main, the constructions as laid down in the school grammars. Nearly

half of the datives in Cæsar's *Bellum Gallicum* are found after compound verbs. Here it might be well to emphasize the fact that the dative does not follow these words because of the preposition, but because of the acquired meaning of the verb. Also be careful to teach your classes that not all verbs compounded with these prepositions take the dative. So in I, 1, 4, *praecedunt* takes the accusative.

The next most important usage is the dative of the object for which, which offers no particular difficulty. Then the dative with adjectives.

More important, on account of the difference between the Latin and the English idiom is the use of the dative after verbs meaning to "spare," "pardon," "favor," "help." Here the teacher should, if possible, explain to his class that this is not an arbitrary rule, but that the dative is used on account of the particular meaning of the verb.

The other uses of the dative range from 18 occurrences down to one, and give plenty of opportunity for variety in the treatment. But it is a matter of question whether, in the case of constructions that are found but once, very much stress should be laid upon them before the class.

THE ABLATIVE

47. According to the summary of Heynacher, we find about 48 different constructions with the ablative, aggregating nearly 3,000 cases, or more than the examples of the genitive, dative and accusative combined. It is evident, therefore, that in the constructions of the ablative we have one of the most important categories in the syntax of Cæsar.

48. The *ablative absolute* is not included by Heynacher in his discussion because, as he says, the use of the ablative absolute in Cæsar is strictly in accordance with the rules of our school grammars. It occurs almost at the outset of the *Bellum Gallicum* (I, 2, 1), and is found 770 times in the treatise; so that it should be made immediatetly as clear to the pupil as possible, and he should be taught how manifold are its usages and translations.

Otherwise the use of the ablative in the *Bellum Gallicum*

corresponds in general to the rules of the grammars. In many instances, however, it is difficult to decide between manner, means, instrument and cause, but in such cases the distinction is not particularly essential for the beginner.

49. The largest category is that which may be called the *ablative of means* or *instrument,* and in its various forms it appears some 600 times in Cæsar. Some scholars make a distinction between the simple ablative of instrument, as in the sentence *deus mundum sole illustrat,* and what is called the *ablativus rei efficientis,* as in the sentence *sole mundus illustratur.* The distinction, however, is not a vital one and it means very little more than this — that the ablative of instrument in the narrower sense is usually found with transitive verbs in the active, and the *ablativus rei efficientis* with passive verbs. The statistics that Heynacher gives are as follows:

50. (a) *With passive verbs*

It is found in Book I 16 times, in Book II 11 times, in Book III 13 times, Book IV 16 times, Book V 32 times, Book VI 17 times, Book VII 52 times.

51. These references do not include the perfect passive participles that follow because we do not always translate them as participles.

Adductus, 21 times; *adfixus,* III, 14, 5; *afflictus,* VI, 27, 2; *captus,* VI, 22, 3; VI, 28, 3; VII, 43, 3; *circumductus,* I, 38, 4; *circummunitus,* II, 30, 2; *coactus,* VI, 6, 2; VII, 59, 1; *commotus,* 4 times; *confectus,* 8 times; *confixus,* III, 13, 4; *conflictatus,* V, 35, 5; *coniunctus,* II, 4, 4; *contaminatus,* VII, 43, 3; *contextus,* VI, 16, 4; *defatigatus,* VII, 48, 4; *defessus,* I, 25, 5; III, 4, 3; VII, 88, 6; *delatus,* V, 8, 2; *elatus,* VII, 47, 3; *exanimatus,* II, 23, 1; *excitatus,* VI, 14, 2; *excruciatus,* VI, 19, 3; *exclusus,* VI, 31, 1; VII, 11, 5; *exercitatus,* II, 20, 3; *exterritus,* VII, 43, 3; VII, 77, 11; *fractus,* I, 31, 7; *impulsus,* I, 40, 4; V, 26, 2; VII, 1, 3; *incitatus,* IV, 14, 3; VII, 28, 4; VII, 48, 1; VII, 60, 4; *inductus,* I, 2, 1; I, 27, 4; *invitatus,* V, 51, 1; VI, 35, 6; *munitus,* II, 29, 2; III, 23, 1; V, 9, 4; V, 21, 2; V, 21, 4; VII, 16, 1; *oppressus,* IV, 15, 2; *permotus,* I, 3, 1; II, 12, 5; II, 24, 4; III, 6, 4; IV, 5, 3; IV, 25, 2; V, 11, 9; V, 22, 3; V, 36, 1; VI, 36, 2; VII, 8, 5; *perspectus,* VII, 54, 2; *perterritus,* I, 22, 4; I, 23, 3; I, 27, 4; IV, 14, 2; IV, 24, 4; V, 3, 5; V, 15, 4; VII, 26, 5; VII, 28, 1; VII, 47, 4;

perturbatus, V, 28, 1; VII, 61, 4; *prohibitus,* VI, 31, 1; *provectus,* V, 8, 2; *reiectus,* V, 5, 2; *repulsus,* I, 8, 4; *revinctus,* III, 13, 5; *subactus,* VII, 77, 12; *sublatus,* I, 15, 3; V, 38, 1; *superatus,* III, 12, 3; *traiectus,* VII, 82, 1; *transfixus,* VII, 62, 4; *vinctus,* I, 53, 5; *vocatus,* VII, 20, 6.

52. The foregoing participles do not occur very frequently with substantives indicating a state of mind. Only the following are found in the *Bellum Gallicum* — and in these cases it is more accurate to regard the ablative as one of cause:

Amentia, I, 40, 4; *cupiditas,* I, 2, 1; I, 9, 3; VII, 50, 4; *furor,* I, 40, 4; *invidia,* VII, 77, 15; *pudor,* I, 39, 3; *spes,* I, 2, 4; IV, 6, 4; IV, 37, 1; *timor,* I, 22, 4; I, 23, 3; I, 27, 4; IV, 15, 2; VII, 26, 5; VII, 43, 3; VII, 77, 11.

53. b) With *intransitive verbs* the ablative of instrument occurs 36 times.

54. (c) With *transitive verbs* in the active it occurs in Book I 25 times, in Book II 14 times, in Book III 8 times, in Book IV 17 times, in Book V 24 times, in Book VI 19 times, in Book VII 41 times.

55. (d) A few cases are found with *adjectives* as follows: III, 17, 5, "idoneo omnibus rebus loco"; VI, 15, 2, "ut quisque est genere copiisque amplissimus"; IV, 16, 7; VII, 14, 9, "oppida quae non munitione et loci natura ab omni sint periculo tuta"; I, 48, 7, "tanta erat horum exercitatione celeritas."

In regard to these cases it is not certain what is the exact interpretation of the ablative. The first two seem more like the ablative of respect, while the remainder border closely on the ablative of cause.

56. When the ablative of *instrument* is used of military ideas it approaches very closely to the ablative of *accompaniment;* thus in the sentence "aliquem equitatu consectari," *equitatu* may be looked upon as the instrument or the accompaniment. In the *Bellum Gallicum,* however, the instrumental relation preponderates.

The following words are the most important cases of this ablative: *agmen novissimum,* I, 15, 3; *copiae,* I, 3, 7; V, 17, 5; V, 27, 4; VI, 1, 3; VI, 1, 4; VI, 8, 1; VII, 41, 2; *equites,* I, 15, 3; *equitatus,* I, 53, 3; I, 53, 5; II, 10, 3; II, 17, 4; III, 20, 3; IV, 4, 5; IV, 32, 5; VI, 8, 7; VII, 68, 3; *excubitores,* VII, 69, 7; *exercitus,* VII, 59, 5; *legatio,* VII, 43, 3; VII, 64, 7;

legio, I, 8, 1; V, 11, 4; *milites* associated with *legio,* I, 8, 1; *milia hominum,* I, 25, 6; *obsides,* I, 31, 9; VI, 2, 2; VII, 2, 2;

In a few cases we find a circumlocution with *opera* instead of the simple ablative, namely, V, 25, 4; V, 27, 2; VII, 13, 2; VII, 20, 12.

Per with the accusative instead of the ablative when persons are the means or instrument, is found 37 times.

57. The ablative of *accompaniment* occurs without the preposition *cum* when the troops are looked upon as a means or the thing, instead of human beings; for example, V, 8, 5, "accessum est ad Britanniam omnibus navibus"; II, 7, 3, "omnibus copiis ad castra contenderunt"; III, 2, 5; "eo pedestribus copiis contendit." Also V, 49, 1; II, 32, 2; VI, 43, 6; V, 9, 3; II, 19, 6; II, 19, 1; IV, 24, 1; II, 29, 1; V, 31, 6; V, 26, 2.

In contrast with these 12 examples of the ablative without *cum* we find 76 cases where *cum* is expressed, as follows: — "cum omnibus copiis" I, 2, 1; I, 26, 6; IV, 21, 3; VII, 62, 10; "cum suis omnibus copiis" I, 38, 1; VI, 10, 4; "cum iis copiis" III, 17, 1; "cum pedestribus copiis" VII, 67, 5. In addition *cum* with *legione* 32 times, with *equitatu* 14 times, with *cohorte* 5 times, with *impedimentis* 4 times, with *exercitu* 3 times, with *navibus, praesidio, numero,* twice each. Once each with *carro,* I, 24, 4; *praeda* VI, 41, 1; *multitudine* IV, 1, 1. We find *cum* used with *mittere* and its compounds 15 times; with *proficisci* 20 times.

58. *Conclusions.* (a) It is best to teach beginners that accompaniment is regularly expressed by *cum.* Thus all ambiguity will be avoided.

(b) The teacher should explain clearly what is meant by accompaniment, and distinguish between that and the instrumental ablative.

(c) It should be emphasized that with definite numbers *cum* is regularly employed, and also with *mittere* and its compounds, and with *proficisci.*

59. Verbs meaning to "equip," "provide with," "furnish," "accustom," "train," etc., require the instrumental ablative. Of these Cæsar shows quite a number, both in the actual and the figurative usage.

"Afficere magno dolore" I, 2, 4; "supplicio" I, 27, 4; "beneficio" I, 35, 2; "laetitia" V, 48, 9; "omnibus cruciatibus"

V, 56, 2; "gravioribus morbis" VI, 16, 2; "magna difficultate" VII, 6, 2; "magno incommodo" VII, 16, 3; "summa difficultate rei frumentaria" VII, 17, 3; "nonnullo beneficio" VII, 37, 4; "magna sollicitudine" VII, 40, 1.

"Assuefacere nullo officio aut disciplina" IV, 1, 9; "Gallicis moribus" IV, 3, 3. "Augere" V, 57, 4. "Durare se hoc labore" VI, 28, 3.

"Exercere hoc genere pugnae" I, 48, 4; "hoc genere venationis" VI, 28, 3; "superioribus proeliis" II, 20, 3.

"Iuvare frumento" I, 26, 6; II, 3, 1; "cibo" VII, 7, 8, 4.

"Inducere scuta pellibus" II, 33, 2. "Instruere omnibus rebus" V, 5, 2. "Inficere se vitro" V, 14, 2. "Ornare rem publicam omnibus rebus" VII, 33, 1. "Induere" VII, 73, 4; "se aliqua re" VII, 82, 1. "Circumdare aliquem aliqua re" IV, 32, 4; VI, 30, 3; VII, 15, 5; I, 51, 2. "Vestire pellibus" V, 14, 2; "vestire multo aggere" VII, 23, 2.

Here belongs also the participle instead of a verb, as seen in III, 14, 2, "naves omni genere armorum ornatissimae."

60. Similar is the construction with verbs meaning to "foster," "maintain," "support," "live," etc.

"Alere aliquem suo sumptu," I, 18, 5; "alere aliquem copiis eorum" IV, 4, 7. "Tolerare corporibus vitam" VII, 77, 12. "Vivere frumento pecore" IV, 1, 8; "vivere piscibus atque ovis avium" IV, 10, 5; "vivere lacte et carne" V, 14, 2.

61. Also verbs signifying to "measure," "judge," "compare," etc.; VI, 18, 2, "spatia omnis temporis non numero dierum sed noctium finiunt"; VI, 12, 7, "quos quod adaequare apud Caesarem gratia intellegebatur"; VI, 24, 6, "ne se quidem ipsi cum illus virtute comparant."

62. The so-called *ablative of limitation* or *respect,* used to express "with reference to," "according to," etc., is found as follows:

"Numero" I, 5, 2; I, 48, 5; I, 49, 3; II, 4, 8; V, 5, 3; V, 23, 4; VII, 64, 1. Also "genere copiisque amplissimus" VI, 15, 2; "erat Romanis nec loco nec numero aequa contentio" VII, 48, 4; "una Sueba natione" I, 53, 4; "oppidum Remorum nomine Bibrax" II, 6, 1; V, 45, 2; "par et virtute et studio pugnandi" V, 34, 2; mutilaeque sunt cornibus" VI, 27, 1; "uri sunt magnitudine paulo infra elephantos" VI, 28, 1; "fama nobiles potentesque bello" VII, 77, 15; "valetudine aut aetate

inutiles sunt bello" VII, 77, 12; VII, 78, 1; "quorum in consilio omnium vestrum consensu pristinae residere virtutis memoria videtur" VII, 77, 4.

63. Akin to these is the ablative with *dignus* and *indignus:* "memoria dignum visum" VII, 25, 1; "vox populi Romani maiestate et superioribus victoriis indigna" VII, 17, 3; "ipsis indignum" V, 35, 5.

64. Also comparative expressions, as: "gratia, dignitate, honore, auctiores esse" I, 43, 8; "equitatu superiorem esse" VII, 65, 4; "natu maior" II, 13, 2; II, 28, 1; IV, 13, 4.

65. This brings us to verbs of "superiority," etc.: "antecedere reliquos scientia atque usu nauticarum rerum" III, 8, 1; "antecedere tantum potentia" VI, 12, 3; "antecedere magnitudine" VI, 27, 1.

"Uter utri virtute anteferendus esset" V, 44, 14; "praestare" I, 2, 2; II, 15, 1; III, 13, 7; "praecedunt virtute" I, 1, 4; "superare virtute" III, 14, 8; VI, 24, 1; "uter eorum vita superavit" VI, 19, 2.

66. Verbs meaning to "provoke," "incite," etc.: I, 15, 3, "quo proelio sublati"; I, 35, 3, "neve Aeduos iniuria lacesseret"; IV, 11, 6, "ne hostis proelio lacesserent"; similarly V, 17, 1; VII, 59, 4; VI, 5, 5, ipsum bello lacesseret."

The Ablative of Cause without a Preposition

67. This ablative is not always easy to distinguish, for like other uses it sometimes shades away until the original idea is well-nigh invisible. For example: in III, 21, 3, "diligentia nostrorum nihil . . . profici posse intellexerunt," some authors claim that *diligentia* is an instrumental ablative, others that it is an ablative of cause.

68. Heynacher makes two divisions of the ablative of cause in the *Bellum Gallicum:* first, the ablative of words of the fourth declension, as: *adventu* I, 36, 4; II, 7, 2; III, 23, 4; IV, 34, 1; VII, 5, 2; *casu* I, 12, 6; V, 48, 8; VI, 30, 2; VII, 20, 6; *coactu* V, 27, 3; *concessu* VII, 20, 2; *consensu* VII, 77, 4 (limitation II, 28, 2); *discessu* V, 3, 6; VII, 20, 1; VII, 41, 4; *interventu* III, 15, 5; *iussu* VII, 3, 1; *iniussu* I, 19, 1; V, 28, 3; *missu* V, 27, 1; VI, 7, 2.

69. Second, the simple ablative to indicate the inner ground

of the act, as VII, 30, 4, "simul in spem veniet aut eius affirmatione"; I, 44, 5, "amicitiam se ea spe petisse"; I, 12, 5, "consilio deorum ea pars princeps poenas persolvit."

So also in VII, 39, 3; III, 8, 3; V, 6, 6; V, 11, 8; V, 54, 2; VII, 43, 1; I, 30, 3; I, 48, 2; II, 9, 4; V, 49, 7; VI, 42, 3; VII, 72, 2; III, 6, 4; III, 21, 3; V, 4, 4; VII, 19, 2; VII, 38, 9; VI, 30, 1; V, 27, 3; VI, 11, 3; VI, 31, 1; I, 44, 2; VII, 41, 1; V, 56, 2; VII, 33, 2; V, 34, 4; I, 14, 1; II, 32, 1; II, 1, 3; VII, 15, 6; III, 10, 3; II, 8, 3; V, 13, 1; I, 18, 8; VII, 75, 5; IV, 34, 1; VI, 36, 1; I, 28, 4; III, 9, 3; VII, 45, 8; VI, 7, 4.

70. The following ablatives are rather unusual: VI, 32, 5, "hunc cum reliquis rebus locum probarat," etc., — we might have expected here "propter reliquas res" instead of the ablative —; III, 20, 1, "Aquitania et regionum latitudine et multitudine hominum ex tertia parte Galliae est aestimanda"; III, 29, 2, "continuatione imbrium diutius . . . contineri non possent." Heynacher calls this a temporal causal.

71. Other ways of indicating cause are as follows:

Causa with substantives showing the purpose or intention as the ground of the act occurs 38 times.

Causa with the genitive of the gerund and gerundive 52 times.

Propter with the accusative, giving the actual ground or occasion, 56 times.

Ob eam rem, causam, has res, etc., 15 times.

Prae occurs with the ablative in VII, 44, 1, but only in a negative sentence.

Ergo is not found with the genitive in the *Bellum Gallicum.* *Gratia* only in VII, 43, 2, "sui purgandi gratia."

Ablativus modi

72. A fixed line of demarcation between the ablative of manner and the instrumental ablative in the narrower sense and of cause cannot be drawn. Haynacher makes two broad divisions:

73. A. *With an Attributive.*

(a) Actual expressions of manner and mode — *consuetudo,* II, 19, 2; II, 32, 1; III, 23, 6; IV, 12, 2; VII, 75, 4. *exemplum,* I, 8, 3. *institutum,* I, 50, 1; VII, 24, 5. *modus,* IV, 17, 4; 4, 27, 3; VI, 12, 7; VI, 44, 1; VII, 14, 2; VII, 20, 2. *mos,* I, 4, 1; I, 8, 3; II, 13, 3; IV, 2, 4; IV, 19, 2; V, 26, 4; V, 37, 3; V, 43,

1; V, 56, 2; VI, 44, 2; VII, 21, 1; VII, 33, 4; VII, 40, 7; VII, 48, 3. *quo pacto,* VII, 83, 5. *ratio,* I, 40, 9; I, 42, 4; III, 28, 1; V, 1, 7; V, 40, 4; V, 58, 1; VI, 9, 4; VII, 4, 1; VII, 6, 2; VII, 14, 2; VII, 21, 1; VII, 25, 3; VII, 38, 10; VII, 71, 9.

These substantives are used with the general attributives *is, alius, omnis, suus.* To express a special attributive the rule is to add the genitive of the substantive: "modo oratoris," "more Gallorum." Still we do find "more Gallico" in V, 43, 1.

74. (b) Concrete ideas — "confectissimo agmine" II, 23, 4; "longissimo agmine magnisque impedimentis" V, 31, 6; "capite demisso" I, 32, 3; "incredibili celeritate" II, 19, 7; "celeritate" also II, 19, 8; II, 31, 2; III, 29, 2; V, 18, 5; V, 40, 2; V, 53, 1; VII, 20, 1; "maximo clamore" V, 43, 3; "commodo rei publicae aliquid facere" I, 354; V, 46, 4; VI, 33, 5; "damno duorum cohortium exercitum reducit" 6, 44, 1; "nudo corpore pugnare" I, 25, 4; "magno cursu" III, 19, 1; "eodem illo cursu" VI, 37, 1; "magno concursu" VII, 48, 1; "magno fletu" I, 32, 1; "continenti impetu" VII, 28, 2; "magno impetu" II, 6, 1; "eo impetu" V, 18, 5; "directis lateribus" VII, 72, 1; "incredibili lenitate" I, 12, 1; "rectis lineis" VII, 23, 5; "Graecis litteris" I, 29, 1; "Graecis litteris" in V, 48, 4 borders on instrumental ablative; "ingenti magnitudine" V, 3, 4; "passis manibus" I, 51, 3; II, 13, 3; "summis opibus" VII, 39, 2; "omnibus precibus" V, 6, 3; VII, 26, 3; VII, 78, 4; "infestis signis" VI, 8, 6; VII, 51, 3; "maiore strepitu et tumultu" VI, 7, 8; "confertis turmis" VII, 80, 6; "pluribus verbis" I, 20, 5; "summa vi contendere" III, 15, 1; VII, 70, 2; VII, 73, 1; "magna voce" IV, 25, 4; "clariore voce" V, 30, 1.

75. (c) Immaterial Qualities. — "non eodem studio atque alacritate" IV, 24, 4; "aequo animo" V, 49, 6; V, 52, 6; VII, 64, 3; "magno animo" VII, 10, 3; "hoc animo" VII, 28, 1; "maiore animo" VII, 66, 6; "ulla alia condicione" VII, 77, 15; "tanta contemptione" V, 29, 2; "maiore contemptione" V, 58, 1; "eadem diligentia" III, 25, 2; "tanta diligentia" V, 58, 1; "magno dolore" VII, 63, 8; "mente alienata" VI, 41, 3; "nullo certo ordine neque imperio" II, 11, 1; "inani simulatione" VII, 19, 3; "specie atque simulatione" VII, 45, 2; "summis simultatibus" V, 44, 2; "sua sponte" I, 44, 2; V, 28, 1; VII, 65, 2; "summo studio" IV, 31, 3; VII, 41, 5; "magno studio" VI, 9, 4; "nullo studio" VII, 17, 2; "sua (or alicuius) voluntate"

(I, 7, 3; I, 30, 4) aliquid facere, reddere I, 35, 3; I, 39, 3; "pendere" I, 44, 4; V, 27, 3.

76. B. *Without the Attributive.*

"Animo et mente" VI, 5, 1; "celeritate" VII, 12, 3; "consuetudine" VI, 27, 5; VII, 24, 2, (nearer to cause as also in IV, 32, 1, where *ex* is used); "iniuria bellum inferre" I, 36, 5; "silentio egredi, excipere," etc., VII, 11, 7; VII, 18, 2; VII, 28, 6; VII, 58, 2; VII, 60, 1; VII, 60, 4; VII, 71, 5; VII, 81, 1.

77. The mode or manner is expressed with *cum* when the substantive has no adjective modifier, in

"Cum cruciatu necari" V, 45, 1; "cum cruciatu constituere" VI, 17, 5; "cum periculo e castris egredi" VII, 74, 2; "cum simulatione timoris agi iubet" V, 50, 5.

But we find the preposition *cum* used also with the modified substantive, when an accessory circumstance accompanying the action or an accompanying fact or result is to be indicated.

"Magno cum periculo" I, 10, 2; I, 47, 3.

"Magno cum periculo magnisque cum portoriis ire" III, 1, 2.

Other examples are to be found in IV, 28, 2; V, 16, 2; V, 19, 2; I, 17, 6; V, 47, 5; V, 52, 3; V, 29, 6; V, 50, 3; I, 20, 1; II, 11, 1; III, 23, 4; V, 44, 13; V, 88, 2; VII, 54, 2; VII, 15, 2; VII, 65, 3; VII, 83, 1.

In every instance the preposition *cum* stands between the adjective and the substantive, except in VI, 34, 7, "cum aliquo militum detrimento"; VI, 36, 1, "cum summa diligentia."

78. From the foregoing we see that Cæsar gives us four examples of the ablative of manner with *cum* when the substantive has no limiting adjective, and 23 examples when an adjective limits the noun. The point to be observed is, that teachers should not insist on a too literal application of the rules as stated in the grammars.

79. *Per* with the accusative as an expression of manner is found as follows: "per vim" I, 14, 3; III, 22, 2; VI, 12, 4; "per insidias" I, 42, 4; "per fidem" I, 46, 3; "per cruciatum" II, 31, 6; "per dolum atque insidias" IV, 13, 1; "per proditionem" VII, 20, 7; "per causam" VII, 9, 1.

The Ablative of Quality

80. The ablative of quality in the *Bellum Gallicum* may be divided into two classes:

81. A. *Those without Verbs.*

Under this head there are three sub-divisions:

(a) *Material Designations.*

II, 18, 2, "collis pari acclivitate"; I, 38, 5, "mons magna altitudine." Examples of like nature may be found in VII, 72, 3; VII, 73, 6; VII, 69, 5; VII, 73, 5; VI, 26, 1; III, 14, 5; IV, 1, 9; VI, 10, 5; VI, 16, 4; VII, 73, 2; VI, 7, 5; VII, 23, 5.

(b) *Parts of the Body.*

Only one example—VII, 50, 2, "dextris humeris exsertis animadvertebantur."

(c) *Immaterial Designations.*

I, 7, 5, "homines inimico animo"; I, 47, 4, "summa virtute et humanitate adulescens." Other examples may be seen in III, 24, 3; VII, 39, 1; II, 6, 4; I, 28, 5.

82. B. *With Verbs.*

The ablative of quality joined with the predicate. Here again we have the same sub-divisions as in A.

(a) *Material Designations.*

I, 39, 1, "ingenti magnitudine corporum esse." Other examples are VI, 28, 1; VII, 23, 1; V, 13, 2; V, 40, 7.

(b) *Parts of the Body.*

V, 14, 3, "Britanni capillo sunt promisso."

(c) *Immaterial Designations.*

With such words as *animus, auctoritas, audacia, exercitatio, gratia, virtus;* I, 6, 3, "quod nondum bono animo . . . viderentur." Also in V, 4, 4; V, 41, 5; II, 15, 1; I, 18, 3; I, 39, 1.

83. It is a question of interest to ask here — What distinction do we find in Cæsar between the genitive and the ablative of quality? The former occurs 82 times, while the latter occurs 34 times.

(1) No numerical statements are in the ablative. Measure, number, time and space are put in the genitive only.

(2) Parts of the body are regularly in the ablative.

(3) When the limiting adjective is replaced by a substantive the ablative regularly occurs, as — "bos cervi figura"; "clavus digiti crassitudine."

(4) In Cæsar the following words occur only in the ablative of quality: *gratia, genus* (= origin), *fastigium, forma, latus, magnitudo, ramus, ripa, transitus, valetudo.*

The Ablative of Measure

84. This ablative occurs with the comparative or with the comparative idea as follows:

III, 13, 1, "carinae *aliquanto* planiores"; V, 13, 2, "Hibernia *dimidio* minor est quam Britannia."

eo, I, 14, 1; III, 12, 5; III, 16, 4; V, 9, 1; VII, 22, 2.

eo magis, I, 23, 3; I, 47, 2; III, 14, 8; V, 1, 2; VI, 40, 1; VII, 25, 1.

eo — quo, I, 14, 1.

quo — hoc, IV, 17, 7.

hoc, I, 2, 3; I, 32, 4; III, 9, 3; IV, 30, 1; V, 14, 2; V, 52, 6.

quo facilius, III, 13, 1.

multo, I, 6, 2; I, 16, 6; I, 46, 4; IV, 3, 4; V, 4, 4; V, 40, 3; V, 55, 1; VI, 42, 2; VII, 14, 10.

nihilo magis, VII, 53, 2.

nihilo minus, I, 5, 1; V, 55, 3; VII, 64, 7.

nihilo secius, I, 49, 4; IV, 17, 9; V, 4, 3; V, 7, 3.

quanto — tanto, V, 45, 1.

paulo, I, 54, 2; II, 20, 1; III, 14, 8; IV, 3, 3; IV, 23, 2; IV, 32, 3; IV, 36, 3; V, 1, 2; V, 27, 9; V, 46, 4; V, 58, 7; VI, 27, 1; VI, 28, 1; VII, 4, 4; VII, 24, 2; VII, 48, 3; VII, 58, 3; VII, 45, 1; VII, 51, 1; VII, 61, 3; VII, 60, 4; VII, 71, 4.

85. The ablative of measure is frequently found in answer to the question — how much later? how much earlier? with the following *ante* or *post,* as — I, 18, 10, "paucis ante diebus," and I, 31, 10; "biduo post" I, 47, 1; "paucis ante annis" III, 20, 1; "anno post" IV, 1, 5; "aliquot diebus ante" IV, 9. 3.

Similarly, in VI, 8, 7; VI, 10, 1; VI, 22, 2; VII, 9, 4; VII, 20, 9.

But *post* and *ante* occur less frequently as prepositions with the accusative, as IV, 9, 1, "post diem tertium"; IV, 28, 1, "post diem quartum"; VI, 33, 4, "post diem septimum."

86. *The Ablative of Price.* — I, 18, 3, "parvo pretio redempta habere"; IV, 2, 2, "iumenta impenso parare pretio"; VII, 19, 4, "Caesar signum proelii exposcentes edocet, quanto

detrimento et quot virorum fortium morte necesse sit constare victoriam"; VII, 39, 3, "cuius salutem levi momento civitas aestimare non potest."

A much rarer use of this ablative is found in VI, 22, 3, "ne studium belli gerendi agricultura commutent."

87. *Ablative of Material.* — This ablative is used with words of filling, abounding and the like. I, 24, 3, "complere hominibus," II, 24, 4; III, 3, 2; III, 18, 8; IV, 26, 4 (militibus); IV, 28, 3; V, 33, 6; VI, 16, 4; "equitatu abundare," VII, 14, 3; VII, 64, 2. Other examples are: VII, 46, 3; VII, 72, 3; VII, 58, 1; VII, 79, 4; VII, 86, 5; VII, 56, 5.

Here belongs also: "donare aliquem aliqua re" I, 47, 4.

Ablatives with Deponents

88. *Utor.*

(a) With ablative of the object: I, 16, 3, "frumento"; I, 20, 3, "opibus ac nervis"; I, 36, 2, "suo iure"; I, 44, 4, "pace uti."

Similarly, II, 32, 4; I, 45, 3; I, 46, 4; I, 51, 1; II, 3, 5; II, 10, 4; II, 14, 5; II, 25, 2; II, 28, 3; III, 8, 1; III, 22, 4; IV, 2, 2; IV, 2, 4; IV, 11, 3; IV, 13, 4; IV, 20, 4; IV, 24, 1; IV, 24, 4; IV, 38, 2; V, 1, 2; V, 12, 4; V, 12, 5; V, 25, 2; VI, 8, 2; VI, 12, 6; VI, 14, 3; VI, 21, 5; VI, 24, 4; VII, 65, 5; VII, 76, 1; VII, 78, 2.

(b) With two ablatives: II, 7, 1, "isdem — ducibus"; V, 41, 8, "se adiutore utantur"; VI, 4, 5, "usi deprecatoribus Remis"; VI, 16, 3, "administris ad ea sacrificia druidibus utuntur"; VI, 35, 10, "usi eodem duce"; VII, 88, 1, "eius adventu ex colore vestitus cognito, quo insigni in proeliis uti consuerat"; VII, 77, 11, "his utimini testibus."

In I, 47, 4 and VII, 11, 1, instead of the second substantive we find an adjective, as, "expeditiore re frumentaria uteretur."

Fruor.

Occurs once, III, 22, 2.

Fungor.

Occurs but once, VII, 25, 3.

Potior.

I, 2, 2; I, 26, 4; I, 30, 3; II, 24, 5; II, 26, 4; III, 24, 2, "victoria."

Also VI, 6, 1; VI, 35, 6; VII, 11, 8; VII, 36, 7; VII, 46, 4; VII, 58, 4.

Potior is used once with the genitive — I, 3, 8, "totius Galliae sese potiri posse sperant." "Rerum potiri" does not occur.

In the gerundive construction we find the genitive in II, 7, 2, and III, 6, 2.

These are simply ablatives of means.

Ablative of the Place Whence

89. *Ablativus Separativus.* — With Verbs of Separation.

This ablative occurs about 300 times in the *Bellum Gallicum.* Its uses are as follows:

"*Abesse* toto bello," VII, 63, 7. Elsewhere with *ab* 25 times.

Abesse ab with persons occurs in I, 41, 5; I, 49, 3; IV, 7, 2; IV, 11, 1; V, 27, 9; V, 46, 1; VI, 7, 2.

Abesse indicates the distance in space or time, with *things* — I, 10, 1; I, 23, 1; I, 43, 1; II, 6, 1; II, 13, 2; II, 16, 1; V, 53, 1; VII, 9, 2; VII, 26, 2; VII, 38, 1; VII, 26, 2; VII, 38, 1; VII, 46, 1; VII, 82, 1.

In a derived sense, I, 1, 3, "Belgae a cultu atque humanitate provinciae . . . absunt"; also in II, 11, 5; V, 2, 2; VI, 3, 5; VI, 14, 1; VII, 63, 7.

Abesse occurs once with the dative, I, 36, 5, "si id non fecissent, longe iis fraternum nomen populi Romani afuturum."

"*Absistere* ab signis legionibusque," V, 17, 2.

"E conspectu *abire,*" VI, 43, 4.

"*Abstinere* proelio," I, 22, 3; "a mulieribus," VII, 47, 5.

"*Avertere* iter ab Arare," I, 16, 3; "iter ab Helvetiis," I, 23, 1; "iter barbaros ab ipso vallo," VI, 42, 2; "animos a se," I, 20, 4.

"*Cedere* loco," VII, 62, 7.

"*Commovere* se ex loco," III, 15, 3.

"*Continere* suos a proelio," I, 15, 4.

"*Convertere* se ab aliquo ad aliquem," V, 44, 10.

"*Decedere* de," I, 31, 10; V, 43, 4. On the other hand, VI, 13, 7, "his omnes decedunt" (reading doubtful).

"*Decidere* equo," I, 48, 6.

"*Deducere* de vallo," V, 51, 2; "exercitum ex his regionibus," I, 44, 11; "cohortes ex proximo castello," VII, 87, 2.

"*Deficere* ab aliquo," II, 14, 3; "ab amicitia," p. R., V, 3, 3; VII, 39, 3.

"*Deicere* ea spe," I, 8, 4; "equo," IV, 12, 5; "opinione trium legionum," V, 48, 1; "muro," VII, 28, 1; "loco," VII, 51, 1; "principatu," VII, 63, 8.

"*Demigrare* ex," IV, 4, 3; "de," 4, 19, 2.

"*Deminuere* de," I, 53, 6; VII, 33, 2; VII, 43, 4.

"*Demittere* de," VII, 47, 6.

"*Depellere* defensores vallo," III, 25, 1; "hostes loco," VII, 67, 5; "nostros loco," VII, 49, 2.

"*Derivare* aquam ex flumine," VII, 72, 3.

"*Desilire* de navibus," IV, 24, 2; "ex navi," IV, 25, 5; "ex equis," IV, 2, 3; "essedis," IV, 33, 1; V, 16, 2; V, 17, 4.

"*Desistere* conatu," I, 8, 4; "pertinacia," I, 42, 3; "negotio," I, 45, 1; "fuga," IV, 12, 2; "sententia," VI, 4, 2; VI, 39, 3; "oppugnatione," VII, 12, 1; "consilio," VII, 26, 5.

"*Deterrere* aliquem ab consilio," V, 4, 1.

"*Detrahere* de," VII, 45, 2.

"*Discedere* ab," 19 times; "discedere ex," 4 times.

"*Educere* copias castris," I, 51, 2; IV, 13, 6; with *ex* occurs 18 times (*e. g.*, I, 50, 1; I, 10, 3; IV, 1, 4; VII, 13, 1).

"*Egredi* finibus," I, 44, 7; "castris," II, 11, 1; "navi," IV, 21, 9; "navibus," IV, 24, 1; "portis," VII, 28, 3; with *ex* it occurs 13 times (*e. g.*, I, 27, 4; II, 13, 2; IV, 27, 3). Notice also the expression: "Egredi extra munitiones," VI, 35, 9; VI, 36, 1.

"*Eicere* domo," IV, 7, 3; but "eicere *ex*" occurs 5 times.

"*Elabi* ex," V, 37, 7.

"*Elicere* ex," VII, 32, 2.

"*Eligere* ex," II, 4, 5; but "Deligere ex" occurs 7 times.

"*Eminere* ex," VII, 73, 6.

"*Emittere* manu scutum," I. 25, 4; "duabis portis," V, 58, 4; *ex* occurs 3 times.

"*Eripere* ex," 3 times.

"*Erumpere* ex," III, 5, 3.

"*Eruptionem facere* . . . portis," III, 6, 1; III, 19, 2; V, 51, 5; VII, 24, 3. On the other hand, "eruptionem facere ex oppido," II, 33, 2 and VII, 73, 1.

"*Evadere* ex," III, 19, 4.

"*Evolare* ex," III, 28, 3; VII, 27, 3.

"*Excedere* proelio," II, 25, 1; III, 4, 3; IV, 12, 6; VII, 80,

4; "pugna," V, 36, 3; "domo," IV, 14, 15; "finibus," IV, 18, 4; VII, 77, 14; "Gallia," VII, 66, 4; "oppido," VII, 78, 1.

On the other hand "ex proelio," IV, 33, 2; "ex pugna," III, 4, 4; "ex via," V, 19, 1; "ex orbe," V, 35, 1; "e civitate," VI, 8, 8; "e finibus," VII, 33, 2.

"*Excludere* a re frumentaria Romanos," VII, 55, 9; "a navigatione," V, 23, 5.

"*Exire*," I, 6, 1; I, 12, 5; I, 29, 1; *ex* occurs I, 5, 1; II, 33, 1; VII, 20, 10; *de*, I, 2, 1.

"*Expellere* finibus," IV, 3, 4; "agris," IV, 4, 2; VI, 23, 2; "castris," IV, 34, 5; "regno domoque," V, 54, 3; "possessionibus," VI, 22, 3; *ex*, V, 9, 7; VII, 4, 4.

"*Exponere* ex," IV, 37, 1.

"*Exstare* ex aqua," V, 18, 5.

"*Intercludere* aliquem re frumentaria," I, 23, 3; "frumento," I, 48, 2; "reditu," III, 23, 6; IV, 30, 2; "omni exitu et pabulatione," VII, 44, 4; "itinere," VII, 59, 1 (but "intercludere aliquem ab exercitu," VII, 1, 6); "a praesidiis," VII, 59, 5. On the other hand, in VII, 11, 8, we find "angustiae multitudinis fugam intercluserant." In III, 24, 2, "commeatu intercluso" is ablative absolute.

"*Interdicere* alicui omni Gallia," I, 46, 4; "sacrificiis," VI, 13, 6; "alicui aqua et igni," VI, 44, 3.

"*Lapsus* hoc spe," V, 55, 3.

"*Levari* Hibernis," V, 27, 11.

"*Liberare* obsidione," IV, 19, 4; V, 49, 6; "stipendio," V, 27, 2.

"*Praecipitare* muro," VII, 50, 3.

"*Profugere* ex," I, 31, 9; VII, 11, 6; VII, 26, 1.

"*Progredi*," V, 56, 1; VII, 49, 3; "extra agmen," VII, 66, 6; "longius a castris," VII, 73, 1; IV, 23, 6; I, 50, 1.

Prohibere. — The use of this verb in Cæsar is rather more varied than that of any of the preceding verbs. He uses it in four ways:

(1) To "keep any one from anything," as:

"Prohibere aliquem finibus," I, 1, 4; "itinere," I, 9, 4; I, 9, 4; I, 10, 4; "rapinis," etc., I, 15, 4; "commeatu," I, 49, 1; II, 9, 4; VII, 14, 2; "agricultura," IV, 1, 2; "pugna," IV, 11, 2; "frumento," etc., IV, 30, 2; "ascensu," V, 32, 2.

Also in VII, 36, 5; VII, 57, 4; VII, 64, 2. But in II, 28, 3 and IV, 34, 4, we find "prohibere aliquem ab."

(2) In the sense of to "keep anything from any one," as: "Prohibere ab oppidis vim hostium," I, 11, 4.

(3) In the sense of to "defend any one against anything," as in V, 21, 1, "ab omni iniuria militum." Also VI, 23, 9; VII, 23, 5.

(4) With a varied construction, VI, 10, 5, "Cheruscos a Suebis Suebosque ab Cheruscis iniuriis, incursionibusque prohibere."

"*Proturbare* de vallo," VII, 81, 2.

"*Removere* equos ex conspectu," I, 25, 1. But "removere *ab*," I, 31, 4; IV, 25, 1; V, 16, 2.

"*Repellere* ab hac spe," V, 42, 1.

"*Solvere* ex portu," IV, 28, 1.

"*Submovere* a portu," VII, 50, 5. Also VII, 25, 4.

90. In the foregoing list we find a large number of uses of the ablative of separation, both with and without the preposition. A careful study of this list will be of great assistance to the teacher. The ablative alone occurs with ten verbs 28 times, the most important of which are: *liberare, interdicere, desistere, deicere,* used in a figurative sense. On the other hand, with 42 verbs of separation the thing never occurs in the simple ablative, but 90 times with the prepositions *ab, de, ex.* Of these we may note:

(a) Those verbs compounded with *dis* and *se*, as:

"*Dimittere* aliquem ex manibus," VI, 8, 1; VI, 37, 10; "ex concilio," III, 18, 7. But, on the other hand, "dimittere aliquem a se," II, 5, 3; VII, 54, 4; VII, 71, 1.

"*Discedere* ab," 14 times with things, but "ex Hibernis," V, 28, 3; V, 41, 6; "ex castris," IV, 30, 2; "ex ea parte vici," III, 2, 1.

"*Differre* ab aliqua re," V, 14, 1; VI, 18, 3; VI, 21, 1; VI, 28, 5.

"*Separare* suum consilium ab reliquis," VII, 63, 8.

(b) Such expressions as "defendere aliquem ab iniuria," I, 31, 16; V, 20, 3; "defendere se ab aliquo," I, 11, 2; II, 31, 5.

By way of summary, then, we see that 18 verbs are found with both constructions. Of these we find 75 examples with the ablative alone and 90 with the prepositions where things, and not

persons, are employed. Or taking all the verbs into consideration, the ablative with the preposition occurs 180 times as against the simple ablative 103 times. The weight of evidence seems to favor the use of a preposition after verbs of separation. Especially to be noted are the constructions after *prohibere, intercludere, liberare, defendere, deicere,* and verbs compounded with *dis* and *se.* Emphasize these constructions and try to bring out the meanings that the different prepositions imply.

The Ablative with Verbs meaning To be deprived of, Lack, etc.

91. Here we find two uses:

(1) *With intransitives.*

"*Carere* cibo," VI, 38, 1; "frumento," VII, 17, 3.

"*Egere*" is found only in VI, 11, 4, but with the genitive *auxilii.*

(2) *With transitives.*

"*Despoliare* aliquem armis," II, 31, 4. See also VII, 79, 7; V, 51, 5; VII, 14, 8; VII, 42, 6; III, 6, 3; II, 6, 2; III, 4, 2; VII, 44, 1; II, 31, 4; V, 6, 5; VII, 66, 5. Note also II, 12, 2.

"*Opus* est," I, 42, 5; I, 34, 2; II, 8, 5.

Verbs denoting birth or origin:

"*Nasci,*" IV, 12, 4: V, 25, 1, "amplissimo genere"; VII, 39, 1, "summo loco"; V, 45, 2, "loco honesto"; VI, 19, 3, "illustriore loco"; VII, 32, 4, "antiquissima familia"; VII, 37, 1, "amplissima." Note, however, II, 18, 2, "ab eo flumine pari acclivitate collis nascebatur"; VII, 43, 5, "profectio nata a timore defectionis"; V, 14, 5, "qui sunt ex his nati."

"*Oriri*": VII, 77, 3, "summo loco." But observe the following: V, 12, 2, "ex civitatibus." Again, in I, 39, 2; II, 14, 1; V, 26, 1; VI, 9, 5; VI, 25, 2, we find "oriri ab."

From the foregoing it will be observed that Cæsar uses *nasci* and *oriri* with the ablative alone, when either one is followed by *loco, genere* or *familia.* In all other cases with a preposition.

Ablativus Comparationis

92. A. The ablative of comparison with adjectives.

(a) The ablative of comparison is used instead of the nominative with *quam;* in IV, 3, 3, "paulo sunt ceteris humaniores"; VI, 26, 1, "cornu exsistit excelsius magisque directum his, quae nobis nota sunt, cornibus."

(b) Instead of the object accusative — in VII, 19, 5, "eorum vitam sua salute habeat cariorem."

(c) Instead of the accusative in answer to the question, "how wide" — "collem ex omnibus fere partibus palus non latior pedibus quinquaginta cingebat," VII, 19, 1.

93. B. The ablative of comparison is found with adverbs.

Amplius.

(a) To indicate quantity: III, 6, 2, "ex hominum milibus amplius XXX plus tertia parte interfecta reliquos in fugam coniciunt."

(b) To indicate extent (space): I, 15, 5, "non amplius quinis aut senis milibus passuum"; I, 23, 1; II, 7, 4; IV, 11, 1; VI, 29, 4; VII, 73, 6.

(c) To indicate time: III, 5, 1; "amplius horis sex"; IV, 37, 3, "amplius horis quattuor."

Longius.

(a) With reference to space: I, 22, 1; IV, 10, 2; IV, 11, 4; VII, 79, 1.

(b) With reference to time: IV, 1, 7; VI, 7, 2; VII, 9, 2. Note that *longius* is always found with a negative in Cæsar.

Minus.

(a) Extent: II, 7, 3.

(b) Time: V, 42, 5.

94. The comparatives *amplius, longius, minus* are found also with other cases without any influence on the construction.

(a) The genitive with *amplius,* denoting extent, I, 38, 5; I, 41, 4; II, 29, 3.

(b) The nominative with *amplius,* V, 8, 6; VII, 15, 1; *minus,* VII, 51, 4. All three indicate quantity.

(c) The accusative with *amplius,* IV, 12, 1; "cum ipsi non amplius octingentos equites haberent," II, 16, 1; *longius,* V, 53, 7, "milia passuum octo."

Hence the teacher should not insist too literally upon the rule

that the ablative always follows comparatives when *quam* is omitted.

The idiomatic ablative, "celerius omnium opinione venire," occurs but once in Cæsar, II, 3, 1.

The Ablative with Names of Cities in Answer to the Question "Whence"

95. "Tolosa et Narbone, III, 20, 2. "Metiosedo, VII, 58, 6; VII, 60, 1.

With names of cities or towns *ab* is frequently used

(a) To indicate more clearly the direction, as; I, 10, 5; VII, 45, 4; VII, 16, 1; VII, 38, 2.

(b) To indicate the environment of the city; VII, 43, 5; VII, 59, 1; VII, 80, 9.

But in three instances we find *ex* used also where the substantive *oppidum* appears, as: "ex oppido Gergovia," VII, 4, 2; "ex oppido Alesia," VII, 79, 3; "ex oppido Cabillono," VII, 42, 5.

96. *Domo:* I, 5, 3; I, 6, 1; I, 12, 5; I, 29, 1; I. 31, 14; I, 53, 4; IV, 7, 4; IV, 14, 5; V, 54, 3.

Ablative of Distance in Space

97. (a) In answer to the question, "how far": *abesse* is used, I, 41, 5; I, 43, 1, with the simple ablative. The accusative with *abesse* occurs 10 times, and with *distare* 3 times.

(b) The distance in which anything happens is expressed:

(1) By the ablative of a numeral, as — I, 43, 2, "legionem passibus ducentis ab eo tumulo constituit"; I, 48, 1; I, 48, 2; V, 24, 7; VI, 35, 6.

(2) By the ablative *spatio*, as — III, 17, 5; IV, 10, 3; IV, 17, 10; IV, 35, 3; VII, 14, 5. Also *intervallo*, I, 43, 3; II, 23, 4; IV, 17, 3; IV, 17, 5; VII, 36, 2.

The accusative occurs 10 times to designate the distance in which anything happens, but when the point of departure is not given, then the measure of distance is designated with *ab* and the ablative, as in II, 7, 3; II, 30, 3; IV, 22, 4; V, 32, 1; VI, 7, 3. But in VI, 36, 2, we find *in* with the ablative — "milibus passuum tribus."

PLACE WHERE

98. A. *Names of Towns.*

(a) Locatives, I, 31, 12; V, 24, 1; VI, 44, 3; VII, 3, 3; VII, 10, 4; VII, 14, 1; VII, 31, 4; VII, 32, 1; VII, 47, 5; VII, 55, 4; VII, 55, 5; VII, 57, 1; VII, 77, 1; VII, 90, 7.

(b) Locative ablatives, as in VII, 90, 7, "Matiscone et Bibracte."

B. *Substantives.*

(a) The locative *domi:* I, 18, 5; I, 20, 2; I, 28, 3; IV, 1, 5; IV, 1, 6; VII, 4, 8; VII, 39, 1.

(b) The locative ablatives:

99. (1) *Locus* with an adjective, rarely with a pronoun or with the genitive of a substantive, with the meaning "instead of": I, 6, 2; 10, 2; 15, 2; 26, 6; 41, 4. II, 8, 3; 33, 4. III, 17, 5; 17, 7; 21, 3; 28, 4. IV, 1, 10; 4, 1; 14, 4; 24, 2; 24, 3; 34, 2. V, 5, 4; 18, 1; 19, 2; 32, 1; 32, 2; 33, 3; 43, 6; 49, 6; 49, 7; 50, 1; 51, 1. VI, 6, 4; 8, 1; 3, 9; 3, 3; 13, 1; 17, 4; 22, 2; 27, 4; 40, 6. VII, 1, 4; 10, 1; 17, 6; 33, 3; 35, 3; 45, 1; 45, 5; 49, 1; 51, 1; 53, 1; 55, 1; 55, 9; 61, 4; 67, 6; 69, 1; 69, 7; 72, 3; 73, 9; 77, 8; 83, 2; 84, 2; 84, 3.

An exception to these is found in I, 42, 6, where the preposition *in* is used with *loco.*

100. A careful analysis of the construction shows that the word *locus* when used with *qui, is, hic,* is usually accompanied with the preposition *in;* otherwise the ablative alone occurs.

"Quo loco" occurs only in IV, 14, 4 (reading doubtful). "In eo loco quo," VI, 22, 2; I, 27, 2. "Quo in loco," I, 49, 1; II, 26, 5; V, 9, 1; VI, 30, 1. "Quibus in locis, IV, 7, 1; VI, 35, 7. "In eo loco," II, 10, 1; III, 20, 1 (plural, V, 7, 3; V, 8, 5). "In his locis," III, 1, 3; III, 7, 3; IV, 20, 1; IV, 22, 1; V, 7, 3; V, 22, 1; VII, 9, 1. "His in locis," IV, 29, 4; "Omnibus in locis" II, 27, 2; VII, 25, 1. Without *in* it occurs 5 times. "Uno in loco," IV, 1, 7.

For stylistic reasons we find *in* used in the following places: II, 18, 3; III, 6, 2; VII, 18, 3; VI, 13, 10; VI, 25, 5; VII, 79, 2. For the sake of clearness *in* is required in IV, 33, 3, "in declivi ac praecipiti loco."

101. (2) *Totus* with a substantive: I, 39, 5; II, 6, 2; V, 34, 1; V, 55, 3; VI, 37, 6; VII, 1, 1; VII, 24, 3; VII, 28, 2; VII, 38, 10; VII, 72, 4.

102 (3) The locative ablative in the sense of *in*. "Castris trinis considere," VII, 66, 3. See also in V, 53, 3; VI, 25, 2; VII, 46, 1; V, 19, 1; VI, 25, 3; VI, 5, 3; VII, 65, 2; V, 15, 1.

"Proelio contendere" I, 48, 3; I, 48, 4. Also I, 50, 5; II, 9, 1; II, 30, 1; III, 28, 2; V, 16, 2; V, 50, 3; I, 50, 4; VII, 77, 8; V, 16, 2; VI, 17, 3; VII, 6, 3; I, 10, 5; I, 44, 3; II, 8, 2; I, 26, 1; V, 26, 3; VII, 80, 4; I, 31, 12; VI, 24, 6.

III, 5, 2 may be considered as both locative and temporal — IV, 3, 4; IV, 2, 1; VI, 7, 3; VI, 12, 9; V, 27, 2; VI, 6, 3; VI, 13, 1; VI, 13, 7; VI, 21, 2.

But we find *in numero* in I, 28, 2; III, 7, 4; III, 27, 1; VI, 23, 8; VI, 32, 1; VII, 39, 1; VII, 75, 4.

The ablative alone occurs further in V, 54, 4; VI, 13, 4; VI, 13, 4; VI, 5, 3; V, 49, 4; VII, 30, 4; VII, 30, 1; VII, 31, 1; VII, 19, 2; VII, 19, 5; VII, 53, 1; II, 21, 2; VII, 47, 1.

103. The following expressions with such verbs as *tenere, se tenere* and *continere,* etc., are used frequently with the ablative, which may be locative and at the time instrumental, as II, 30, 2; I, 40, 8; I, 49, 1; III, 17, 5; III, 24, 4; V, 57, 1; I, 48, 4; II, 11, 2; VI, 24, 3; VII, 80, 4; V, 44, 6; I, 7, 4; I, 14, 1.

104. (4) The locative ablative in the sense of "in" or "by," as *stare decreto,* VI, 13, 6; I, 14, 4; IV, 2, 2.

105. (5) The locative indicating the goal: VII, 45, 5, "legionem silvis occultat." Also VI, 31, 3. In VI, 85, 6, the reading is doubtful.

Time When

106. The ablative used with a pronoun, *hoc, illo* or *eodem,* or with a numeral adjective, occurs 60 times.

Tempore, 42 times; *nocte* (*tota, prima, multa*), 20 times; *noctu* (alone), 15 times; *prima luce,* 11 times; *memoria,* 7 times; *diebus* (*paucis quibus*), 7 times; *postridie eius diei,* 7 times; *bello,* with an attributive, 6 times; *virgilia* (*prima, secunda, tertia*), 6 times.

Anno with an attributive, 5 times; *annis,* 4 times; *hora* and *horis* with an attributive, 4 times; *adventu,* 4 times; *aetate,* 2 times; *Aestate,* 2 times; *primo concursu,* 2 times.

Also *proelio, proeliis, interdiu, silentio noctis, pridie,* 10 times.

PREPOSITIONS

107. It is safe to say that no other part of speech receives as little attention with beginners as the preposition. Teachers expect the pupils to absorb or gather up in some mysterious way a knowledge of the uses of the different prepositions. I have known many pupils that have finished Cæsar who could not tell how he used *ad* or *cum* or *in* or *ex*. When we stop to consider that in Cæsar we find *ab* and *ex* used nearly 1,000 times together we can begin to see the importance of these words. Space will not permit a tabulation of all the uses of the prepositions in Cæsar. We will therefore point out the more important ones, with illustrative references for each.

There are 518 uses of the prepositions with the accusative in the *Bellum Gallicum*, not counting *ad*, "near to" or "at"; *inter*, "between" or "among"; inter *se;* and *contra*, "against." This involves 79 different kinds of constructions with prepositions that govern the accusative. From these figures it is plain that some of these words are used in very different senses.

Prepositions with the Accusative

108. *Ad* occurs over 200 times in the *Bellum Gallicum* exclusive of the uses referred to above. It has a wide range and offers many points of interest to the intelligent teacher. If we consider it with reference to its more common uses, with such meanings as "to," "towards," "near to," "up to," etc., including the expressions *ad unum omnes* (5 times), and *ad numerum*, V, 20, 4, and also *ad multam noctem*, I, 26, 3; *ad mediam noctem*, V, 31, 3; *ad tempus*, IV, 23, 5; *ad extremum*, III, 3, 4; *ad diem*, II, 5, 1; V, 1, 9; and *quem ad diem*, VII, 77, 10, we shall find the following uses of this preposition in Cæsar:

(1) *Ad* = "according to," "conformable to." I, 36, 1, "ad alterius praescriptum sed ad suum arbitrium." See also IV, 17, 3; V, 12, 4; V, 42, 5; "ad hunc modum" II, 31, 1; III, 13, 1; V, 24, 6; V, 27, 1. The adverbial "quem ad modum" occurs 4 times. "Ad nutum," I, 31, 12; "ad voluntatem eius," IV. 5, 3; IV, 23, 5; "ad imperatum," VI, 2, 3; "ad clamorem convenire," IV, 37, 12. In all 13.

(2) *Ad* = "with reference to," "for"; II, 26, 5; III, 25, 1; IV, 16, 6; IV, 19, 4; V, 1, 3; VI, 13, 1; VII, 66, 4. "Ad omnes casus subsidia comparabat," IV, 31, 1. With expressions of hindering, V, 11, 6; "ne nocturnis quidem temporibus ad laborem militum intermissis; also in I, 25, 3; II, 25, 1; IV, 40, 5. In all 12.

(3) *Ad,* "towards," in designation of time. "Ad solis occasum," V, 8, 2; "ad vesperum," twice (cf. "sub vesperum," 3 times); "ad extremum," IV, 4, 1; "ad extremam orationem," VII, 53, 1. In designation of numbers, II, 4, 10; II, 33, 5. In all 7.

(4) *Ad* with names of cities = "in the vicinity of," "near to," I, 7, 1; VII, 41, 1; VII, 58, 5; VII, 76, 5; VII, 79, 1. In all 5.

(5) *Ad* with persons = *apud.* III, 9, 3; IV, 16, 7, "ad nationes"; VII, 5, 3, "ad exercitum."

109. From the phraseological point of view we may note:

"Accedere ad" occurs 11 times.

"Ea res ad plures pertinet," V, 25, 4; "ad multos," VII, 43, 3; "quae ad animos effimandos pertinent," I, 1, 3; "res ad luxuriam pertinentes," II, 15, 4; "quae ad oppugnationem pertinent," VII, 19, 6; VII, 81, 2; "quod ad militum salutem pertinet," V, 36, 2; "quae res ad salutem exercitus pertinet," VI, 34, 3; "ad proficiscendum," I, 3, 1; "ad usum navium," III, 9, 4.

"Imperium deferre ad aliquem," 16 times.

"Deferre ad aliquem summam belli," II, 4, 7.

"Evocare ad se; ad praedam, pugnam, bellum," 7 times.

"Respondere ad aliquid," 6 times.

"Descendere ad aliquid," 4 times.

"Ad eiusmodi consilium," V, 29, 5; "ad innocentium supplicia," VI, 16, 5; "ad vim atque arma," VII, 33, 1.

"Referre ad aliquem," 4 times; "referre in publicum," VI, 28, 3.

"Proicere alicui se ad pedes," I, 27, 2; III, 1, 2; VII, 26, 3.

"Procumbere alicui ad pedes," VII, 15, 4.

"Adhibere aliquem ad consilium," I, 40, 1; VII, 77, 3.

"Perducere aliquem ad suam sententiam," III, 8, 5; VII, 4, 3.

"Perducere ex humili loco ad summam dignitatem," VII, 39, 1; "perducere aliquem ad se magnis iacturis pollicitationibus-

que," VI, 12, 2; " res disputatione ad mediam noctem perducitur," V, 31, 3.

" Hoc unum Cæsari ad pristinam fortunam defuit," IV, 26, 5; " paulum ad summam felicitatem defuit," VI, 43, 5.

" Ad iniquam condicionem pugnandi deduci," VI, 10, 2; " ad eam sententiam cum reliquis causis haec quoque ratio eos deduxit," II, 10, 5.

" Naves ad ancoras deligare," IV, 29, 2; V, 9, 1.

The following occur once each:

" Signa ad hostem convertere," VI, 8, 5.

" Ad bellum proficisci," VI, 29, 4; " ad hostem," VII, 32, 2; but " contra hostem," VI, 7, 4.

" Milites alicui ad bellum mittere," VII, 37, 7.

" Desilire ad pedes," IV, 12, 2.

" Omnium oculis mentibusque ad pugnam intentis," III, 26, 2.

" Ad animum utrisque occurrit," VII, 85, 2.

" Res ad paucitatem defensorum pervenit," V, 45, 1.

" Posse hunc casum ad ipsos recidere," VII, 1, 4.

" Gentem ad internecionem redigere," II, 28, 1.

" Afferre aliquid ad amicitiam populi R.," I, 43, 8.

With *utilis ad* is used 3 times and with *idoneus* 3 times. For other uses see under *ad* with the gerund.

110. *Adversus.* This preposition is found only in IV, 14, 2, " adversus hostem copias ducere."

111. *Ante.* As an adverb of time this word occurs 37 times, but as preposition = " before, in point of time," it occurs 16 times. *Ante* = " before, in place," is found 9 times.

The adverb *antea* occurs 7 times, as *e. g.,* I, 17, 7; I, 42, 2; I, 42, 1; VI, 24, 1.

112. *Apud.* *Apud* occurs with persons 41 times. Only in II, 7, 3 do all the manuscripts agree in " *apud oppidum morati.*" In VII, 75, 1, *apud Alesiam,* there is a difference of opinion, Meusel, following β, gives *ad,* in support of which Cæsar furnishes 31 examples.

Notice also the following expressions, which may be classed as phraseological:

I, 9, 3, " plurimum posse apud aliquem "; I, 17, 1; I, 1, 4, " valere apud aliquem "; I, 18, 6, " largiter posse apud aliquem "; V, 14, 4, " tantum apud homines Barbaros valuit " (this expres-

sion is interesting because it is followed by the infinitive with subject accusative); VII, 76, 6, "tantum apud me dignitas potest." In all 6.

Notice also "apud aliquem dicere," I, 19, 4, and "apud aliquem loqui," V, 27, 1.

113. *Contra*, etc. This word has two meanings in Cæsar.

(a) Denoting place = "opposite," "in opposition to."

(b) Denoting hostility = "against."

Note the expressions "contra opinionem," III, 9, 6; VI, 31, 1; VII, 56, 3; "praeter opinionem," III, 3, 2; "contra voluntatem," IV, 1, 9; VII, 35, 7.

114. *Erga.* Only in V, 54, 4, "pro vetere ac perpetua erga populum Romanum fide."

115. *Extra.* "Outside of," indicating place, 7 times.

116. *Inter.* "In," "between," "among," "during." In the sense of "during" only once, I, 36, 7, "qui inter annos XIV tectum non subiissent." The more common use of this word is "among." It occurs 10 times, as II, 4, 5; II, 4, 8; V, 4, 3, "plurimum inter eos valere"; II, 15, 1, "magna inter Belgas auctoritate." With the genitive of quality, V, 6, 1; V, 54, 2; with *constat*, VII, 44, 3; VII 47, 7; with *interesse*, I, 15, 5; VI, 36, 2.

117. *Infra.* "Below," of place, VI, 35, 6, "infra eum locum." "Below," of measure, VI, 28, 1, "uri sunt magnitudine paulo infra elephantes."

118. *Intra.* "Within," of place, 13 times. I, 32, 5; II, 18, 3; II, 19, 6; V, 37, 5; V, 44, 13; V, 48, 5; V, 51, 2; V, 57, 3; V 57, 4; V, 58, 1; VII, 47, 4; VII, 51, 4; VII, 70, 6.

Intra, "into," "within," 4 times, "intrare intra praesidia," VII, 8, 1. "Intra fines suos ingredi," II, 4, 2; V, 9, 6; also VII, 65, 2. Of time only in VI, 21, 5, "intra annum vicessimum."

119. *Iuxta*, "close by," "near." This word occurs in Cæsar but once; then it is used adverbially, II, 26, 1, "iuxta constiterat."

120. *Ob.* "On account of." Used 15 times with *eam rem, causam, has res, quam ob rem.*

121. *Penes.* "In the hands of." Only in VII, 21, 3, "penes eos summam victoriae constare."

122. *Per.* (1) "Through," of place. 31 times.

(2) "In," "over," of extent; "per eorum corpora," II, 10, 3; "per omnes partes," IV, 33, 1; "per temonem," IV, 33, 3. Also in VI, 31, 2; VII, 3, 2.

(3) "While," "during," of time; "per concilium," VI, 20, 3.

(4) "Through" (the instrumentality of), of persons, 37 times. Here belong such expressions as, "per se administrabant," II, 20, 4; "omnia per se obire," V, 33, 3. Similarly, V, 49, 7; VI, 12, 2; VI, 13, 1; VI, 59, 2; "ipse per se," VI, 37, 5; "per te licet," V, 30, 3; "per se licere," I, 42, 1; V, 41, 6.

(5) "By means of," of things. I, 4, 1, "ea res . . . per indicium enuntiata"; III, 9, 2; II, 16, 4, "per aetatem ad pugnam inutiles"; V, 3, 4; VII, 71, 2; VII, 25, 2, "per manus tradere." Similarly, VI, 38, 4; VII, 47, 6.

(6) In association with neuter ideas to indicate the method and manner, as, "per vim," I, 14, 3; III, 11, 2; III, 22, 2; VI, 12, 4; "per insidias," I, 42, 4; IV, 13, 1; "per fidem eos circumventos esse," I, 46, 3; "per causam," VII, 9, 1; "per proditionem," VII, 20, 7. In all 9 times.

123. *Post.* "Behind," "after," etc. Of place, 12 times; of time, 14 times.

124. *Praeter.* (1) "Beyond." I, 48, 2, "praeter castra Caesaris suas copias traduxit."

(2) "Except," "in addition to." I, 43, 3, "praeter se denos ut ad colloquium adducerent, postulavit."

(3) "Except," "outside of." I, 11, 5; IV, 1, 10; IV, 20, 3; V, 12, 5; V, 14, 3; V, 24, 7; V, 54, 4; VI, 3, 4.

(4) "Contrary to." "Praeter consuetudinem," VII, 61, 3; "praeter opinionem," III, 3, 2; "praeter spem," VI, 8, 6; VI, 40, 8.

125. *Prope.* "Near to." VII, 36, 2, "prope oppidum"; also I, 22, 3.

(2) Adverbial, "near" = "nearly," "almost." 19 times.

126. *Propter.* "On account of." Gives the actual ground for an action. 56 times.

127. *Secundum.* (1) "Along." II, 18, 3, "secundum flumen," also VII, 34, 2.

(2) "Besides," "in addition to." I, 33, 2, "secundum ea, multae res eum hortabantur."

(3) "In accordance with." IV, 17, 4, "secundum naturam."

128. *Supra.* (1) "Above," etc., of place, IV, 17, 10, "supra pontem"; VI, 9, 3, "supra eum locum."

(2) "Before," of time, VI, 19, 4, "paulo supra hanc memoriam."

(3) As an adverb in the sense of "above," "before," 22 times. See, for example, II, 1, 1, "uti supra demonstravimus."

129. *Trans.* "Over," "across"; with streams, 23 times.

130. *Versus.* (1) "Toward," VI, 33, 1, "ad oceanum versus"'; VII, 8, 5, "in Arvernos versus."

(2) With names of cities, VII, 7, 2, "Narbonem versus"; VII, 61, 5, "Mitiosedum versus."

(3) "Quoque versus" = "in every direction," VII, 14, 5.

131. From the foregoing the manifold uses of prepositions with the accusative can be seen. Despite the fact that *ad* = "according to," and *ad* = "with reference to," occur 13 and 12 times respectively, and *ad* = "towards," with statements of time, and also with numerical statements, occurs 7 times, experience has shown that few second-year pupils have any knowledge of these uses. On the other hand, there may be many who do not know that Cæsar uses *ad* in at least five, and *per* in six different ways.

Prepositions with the Ablative

132. In this construction also we find a large number of uses in Cæsar. The ablative with the prepositions *ab, cum, de, ex, in, pro, sine* occurs over 1700 times.

133. *Ab* occurs in Cæsar over 400 times. The majority of its uses are not particularly difficult. Such expressions as *discere ab aliquo aliquid; haec ab me beneficia habetis; auxilia ab Vercingetorige arcesseret; milites ab se dimisit,* may be readily paralleled in other languages. Yet there are other uses also; for as a matter of fact, we find *ab* used in eight different ways in Cæsar, as follows:

(a) The most important, because the most frequent, use of *ab* is that used to designate the personal agent; this occurs over 200 times.

(b) Next in order is that use of *ab* which indicates the side upon which anything happens.

It is further to be noted:

134. (1) In those 200 or more examples referred to in (a) are included the collectives, as: "ab civitate erat interfectus," VII, 4, 1; "repulsi ab equitatu," V, 9, 4; "a multitudine Sedunorum teneri," III, 2, 1.

Here are included also the cases with intransitives that are really passive in sense, as: "equites ab Q. Atrio ad Caesarem venerunt," V, 10, 2, where *venerunt* is the same as *missi sunt*. So also in I, 20, 4; I, 37, 1; IV, 3, 2; IV, 18, 3; IV, 21, 5; V, 28, 5.

135. (2) Those indicating the side upon which anything happens = "on":

"Ab ea, dextra, sinistra, superiore, inferiore, utraque parte," 11 times.

"Ab latere," III, 29, 1; "a latere aperto," 4 times; "a dextro latere," 3 times; "ab utroque latere," 3 times; "ab lateribus," II, 8, 4; "ab duobus lateribus," VII, 67, 1. 13 times in all.

"Ab dextro cornu"; "ab sinistro cornu." 5 times.

"Ab primo agmine," VII, 67, 1; "ab novissimo agmine," I, 23, 3; ab extremo agmine," II, 11, 4.

"Ab fronte," II, 23, 4; II, 25, 1.

"Ab tergo," VII, 87, 4.

"Ab imo," III, 19, 1; IV, 17, 3; VII, 19, 11; "ab infimo," VII, 73, 3; "ab infimo solo," VII, 73, 7; "ab radicibus," VI, 27, 4.

"Ab decumana porta," II, 24, 2; III, 25, 2; VI, 37, 1; "ab septemtrionibus," VII, 83, 2; "huc illi stipites ab ramis eminebant," VII, 73, 3.

136. (3) *Ab* indicates "from," etc., a place.

(a) With the accusative of extent in answer to the question "how far?" I, 21, 1, "hostes consedisse milia passuum ab ipsius castris octo." See also I, 22, 5; I, 38, 1; I, 49, 1; I, 50, 1; IV, 23, 6; V, 2, 3; V, 11, 8; V, 47, 5; VII, 16, 1; VII, 66, 2; VII, 72, 2.

(b) With the ablative of measure in answer to the question "how far?" I, 48, 1, "milibus passuum sex a Caesaris castris sub monte consedit." See also II, 23, 4; VII, 14, 5. Also after the ablative of comparison, VII, 79, 1.

(c) After adverbs. IV, 1, 1, "non longe a mari." Also V, 30, 3; VII, 79, 2.

(d) *Ab* = "from" with the other terminus given by:

(1) *ad*, I, 1, 7; I, 8, 1;

(2) *in*, II, 15, 2; II, 18, 1; II, 21, 6; III, 1, 1; V, 3, 4; VI, 29, 4; VII, 45, 4.

137. (4) *Ab* = "from," "on," or "at," of time. "A prima luce," V, 35, 3; "ab initio," VI, 8, 9; VII, 13, 1; VII, 28, 6; "ab parvulis," VI, 21, 3; "a pueris," IV, 1, 9.

See also I, 26, 2; III, 15, 5; VII, 80, 6.

In V, 45, 2, *a prima obsidione* is to be interpreted *since the siege began* — not "immediately after the siege." So also in II, 25, 1.

138. (5) *Ab* is used with verbs compounded with *dis* and *se* 29 times, as follows:

"Discedere ab," 14 times; "dividere ab," 6 times; "differre ab aliqua re," 4 times; "dimittere aliquem a se," 3 times; "discludere ab," VII, 8, 2; "separare suum consilium ab reliquis," VII, 63, 8.

139. (6) *Oriri ab aliquo* or *aliqua re* occurs but five times, but is noteworthy because of the different meanings implied. In I, 39, 2 we can translate *ab*, "among"; also in VI, 9, 5. But in VI, 25, 2, "on" or "at" is the meaning.

140. (7) *Ab* is used with names of towns when the direction from that place is to be emphasized, as: "erat ab Gergovia despectus in castra," VII, 45, 4 and VII, 80, 9. Also when there is a discussion as to leaving the town, as in VII, 43, 5; VII, 59, 1.

141. (8) *Ab* = "at a distance from" when the point of departure is not given. II, 7, 3; II, 30, 3; IV, 22, 4; V, 32, 1; VI, 7, 3.

142. *De* occurs nearly 300 times in the *Bellum Gallicum*. The usual meanings given in the vocabularies are "from," "away from," "concerning." Yet *de* has other meanings besides these. Some writers go so far as to say that *ab* = "away from," etc.; *ex* = "out of," and *de* = "down from." But neither will such a classification stand the test, for in I, 2, 1, "de finibus suis exire," and in IV, 19, 2, "de oppidis demigrare," *de* does not mean "down from." Even in V, 43, 4, "de vallo decedere," we dare not insist too literally on this idea. There are instances where it is difficult to distinguish between *de* and *ex*, just as in English we say, "He is going to move out of the city," or, "He is going to move away from the city." The safest plan is to study carefully the different uses of these prepositions and show the coloring of the words where it is possible.

The following uses of *de* are important:

143. (1) *Concerning, of:* "cognoscere de aliqua re," I, 35, 2; IV, 11, 5; V, 3, 3; V, 45, 5; V, 52, 4; VII, 1, 1; VII, 12, 1; VII, 55, 4; VII, 81, 2.

"Significare de fuga," VII, 26, 4.

" Desperare de," I, 18, 9; I, 40, 4; I, 40, 8; I, 40, 10; VII, 36, 1; VII, 85, 3.

" Recusare de stipendio," I, 44, 4.

" Impetrare de," IV, 13, 5; V, 36, 3.

" Addunt de morte Sabini," V, 41, 4.

" Docere de suo adventu," VII, 10, 3.

" Demonstrari de," IV, 28, 1.

" Remittendum de celeritate existimabat," V, 49, 6.

" De eius adventu Arvernis nuntiari," VII, 9, 5.

" Proponere de," VI, 11, 1.

" Provisum est de frumento," III, 3, 1.

144. These 26 examples should be carefully studied and especially emphasized as they are met with in reading, because they are out of the ordinary. E.g., If a second-year pupil were asked to write in Latin the following sentence, " News of his arrival was brought to the Arveni," it is quite probable that he would try the genitive, because he saw " of " in the sentence.

145. (2) *Away from.*

" De muro iacere," II, 32, 4; " iactare," VII, 47, 5; " eicere," 7, 24, " demittere," VII, 47, 6; " manus tendere," VII, 48, 3.

" De vallo deducere," V, 51, 2; " proturbare," VII, 81, 2.

" De locis superioribus cerni," VII, 88, 1.

" De navibus desilire," IV, 24, 2.

" De mulis stramenta detrahere," VII, 45, 2.

In these ten examples is an opportunity to impress upon pupils the fact that *de* also may mean " from " as well as *ab* and *ex*. The distinction seems to be this. *De* meant " down from," then, " from." *Ex* meant " out of " and then, " from." *Ab* " away from," then " from." In III, 13, 3, " pacem petere . . . ex muro," *ex* does not mean " out of " but rather " down from " (cf, II, 30, 3). In I, 2, 1, " de finibus exire," *de* does not mean " down from," but rather " out of." In II, 4, 1, " oriri ab Germanis," *ab* does not indicate that the Belgæ sprang from the borders of the Germans. From these examples it will be seen that often the original idea has faded away until we might almost say there is no difference. Yet there is in a majority of Cæsar's uses of *ab, de* and *ex* a trace of the original distinction.

146. (3) The partitive use of *de*.

" Pauci de nostris, I, 15, 2; also V, 42, 3; VI, 13, 3.

This use is not common; but as it occurs early in Cæsar (I, 15,

2), it affords the teacher an opportunity to enlarge upon the partitive use in general. Thus it would be interesting to cite and explain the following examples:

"Pars militum"; "unus ex militibus"; "pauci de nostris"; nihil reliqui"; "nos trecenti coniuravimus" = "300 of us," etc.; "qui omnes" = "all of whom."

147. (4) Phraseological use of *de.*

"Agere de," I, 31, 1; I, 34, 1; I, 47, 1.

148. (5) *De* = "away from." I, 2, 1, exirent. So with *deminuere* in I, 53, 6; VII, 33, 2; VII, 43, 4.

149. *Ex* occurs over 300 times in the *Bellum Gallicum.*

Pupils with ordinary preliminary training will usually recognize the commoner uses of *ex, "out of,"* etc., "away from," and will usually translate such expression as the following correctly:

"Ex eo oppido pons pertinet ad Helvetios"; "ex silva in nostros impetum fecerunt"; "comportare (conferre and cogere), frumentum ex agris in oppidum"; "ex loco superiore telum mittere"; "aliquem conspicere ex litore"; "ex oppido videri"; *ex* with *factus -a -um* (II, 33, 2); "scutum ex cortice" (III, 13, 3); "navis ex robore" (V, 40, 2); "ex materia turres excitantur" and "ex finibus suis progredi."

In Cæsar there are 9 different uses of *ex:*

150. (1) While we find *ex* repeated 65 times with verbs compounded with *ex,* yet with such verbs the ablative alone is found 25 times. Consequently it would be safe, according to Heynacher, to always repeat the preposition except —

(a) After *excedere* and *expellere,* though in IV, 34, 5 and in IV, 4, 1, we find *expello* used without the preposition.

(b) With *domo* after *excedere, exire* and *eicere.*

151. (2) *Ex* used partitively.

(a) With definite numbers, I, 29, 2; II, 29, 4; IV, 12, 3; IV, 32, 2; IV, 36, 4; VI, 36, 3; VII, 28, 5; VII, 33, 3; VII, 68, 2; VII, 89, 5 (*singula ex*). Total, 10 times.

Unus ex occurs 12 times; while *unus* followed by the genitive occurs 3 times; VI, 9, 2; I, 1, 1; VII, 35, 3.

(b) With indefinite adjectives or pronouns.

"Aliquis," I, 47, 1 (*e suis*); V, 26, 4 (*ex nostris*).

"Alter," V, 3, 3.

"Complures," II, 17, 2; IV, 35, 3; IV, 37, 3.

"Is," I, 41, 4; "quod ex aliis ei maximum fidem habebat."
"Nonnulli, V, 15, 2 (*ex suis*); VI, 7, 7.
"Plurimi," VI, 28, 3.
"Principes," V, 3, 5; VII, 2, 1.
"Pauci," III, 28, 4; VII, 88, 4.
"Perpauci," III, 15, 5; V, 5, 4; V, 23, 4; VII, 11, 8.
"Qui," I, 39, 6; II, 3, 1; V, 30, 2; V, 56, 2; VI, 23, 8.
"Quid," V, 31, 4.
"Nequis" VI, 11, 4.
"Ubi quis," VI, 23, 7.
"Quidam," I, 42, 6; II, 17, 2; V, 48, 3; VI, 30, 4.
"Ulla navis," V, 23, 3.
"Tantae pecuniae," VI, 19, 1.

Notice also, "magnum ex his (iis) numerum," I, 54, 1; V, 51, 5; also "ex milium L numero vix quarta parte relicta," III, 26, 6. Otherwise the preposition is not used with substantatives.

(c) We find the partitive genitive with superlatives 12 times, while *ex* with the ablative occurs 3 times when the superlative belongs to the predicate, as I, 30, 3, "locum quem ex omni Gallia opportunissimum ac fructuosissimum iudicasset." So also in V, 14, 1, "ex his omnibus longe sunt humanissimi"; VI, 25, 5, "ex quibus quae maxime differant," etc.

(d) In such expressions as: "ex quibus sunt qui," etc.: IV, 10, 5; "ex quibus L. Petrosidius," etc., V, 37, 5. Also V, 44, 3; VII, 39, 3; VII, 75, 5.

152. (3) Two substantives are directly joined by the use of *ex*.

(a) In statements of source or origin.

"Omnes ex Gallia naves," V, 13, 1.

"Q. Iunius ex Hispania quidam," V, 27, 1. So also in V, 25, 3; I, 47, 3; VI, 1, 2; VI, 32, 1; VII, 65, 1; VII, 43, 3; IV, 33, 1; V, 13, 4.

(b) In statements of the material out of which anything is made or consists.

"Ferventes fusili ex argilla glandes," V, 43, 1.

"Pinnae loricaeque ex cratibus," V, 40, 6.

(c) Note the single example in III, 14, 1, where a genitive might have been expected: "altitudo puppium ex Barbaris navibus."

153. (4) Of importance are the various ideas contained in the expression *ex fuga.*

(a) Of space — referring to what actually transpires while the flight is taking place, thus — "se ex fuga recipere," VI, 41, 3; VII, 20, 12. So also in VI, 35, 5; VII, 28, 6; VI, 35, 6; III, 19, 4; II, 12, 4; VI, 32, 2; VII, 88, 7.

(b) Of time — II, 12, 1; IV, 27, 1. Similarly "ex timore," IV, 34, 1; V, 15, 3.

154. (5) Note the adverbial expressions with *ex:*

"Ex contrario, VII, 30, 3; "ex occulto, VI, 34, 6; "ex usu," I, 30, 2; I, 50, 4; V, 6, 6; VI, 20, 3.

155. (6) *Ex* = "owing to," etc., "according to," "conformable to."

"Ex sua consuetudine," I, 52, 4; "ex communi consensu," I, 30, 4; "ex consuetudine," IV, 32, 1; V, 58, 2; "ex litteris," II, 35, 4; IV, 38, 5; "ex similitudine," VII, 73, 8.

156. (7) *Ex itinere* = "direct from the march." I, 25, 6; II, 6, 1; II, 12, 2; II, 29, 1; III, 21, 2.

157. (8) *Ex,* of time = "since."

"Ex eo tempore quo," IV, 18, 4. Also in I, 42, 3; I, 48, 3; I, 16, 4.

158. (9) *Ex,* "in consequence of," indicates the ground and cause for anything.

I, 39, 1, "ex percontatione nostrorum vocibusque Gallorum ac mercatorum tantus subito timor omnem exercitum occupavit."

159. Such are the more important, or rather more frequent, uses of *ex.* But they are by no means all, for statistics show that *ex* is found in 34 different phrases, each of which occurs but once in the *Bellum Gallicum.*

160. *Cum* is used as a preposition in some 161 passages, in 76 of which it expresses accompaniment (see under the instrumental ablative), and in 26 manner (see under ablative of manner).

In addition the following categories are found:

161. (1) *Cum* with verbs which indicate hostility is found in such expressions as: "bellum gerere cum aliquo," I, 1, 4; IV, 6, 5; VII, 75, 5; "confligere," II, 5, 2; V, 15, 1; VII, 32, 5; " proelium committere," I, 15, 2; II, 19, 4; V, 50, 4; "contendere," 5 times; "congredi," 5 times.

Once each:

"Contentionem habere cum aliquo," I, 44, 9; "proelium fore," I, 46, 3; "dimicare," III, 17, 7; "pugnare," IV, 24, 2; "controversiam habere," VII, 67, 7.

162. (2) "Communicare aliquid cum aliquo," IV, 13, 4; V, 36, 3; VI, 2, 3; VI, 19, 1; VI, 20, 1; VII, 37, 2.

163. (3) *Cum,* "under," "under the care of"—V, 24, 2 "quartam in remis cum Tito Labieno . . . hiemare iussit." Here *cum* does not mean "in company with," but rather, *under the eye of,* Labienus. So in V, 38, 4; VI, 1, 4; VII, 51, 2.

164. (4) *Cum* with *intercedere*: "Huic cum reliquis civitatibus continentia bella intercesserant," V, 11, 9; "quam veteres quamque iustae causae necessitudinis ipsis cum Aeduis intercederent," I, 43, 6.

165. (5) Two substantives are joined directly by *cum.* V, 41, 1, "aliquem sermonis aditum causamque amicitiae cum Cicerone habere"; VII, 45, 2, "muliones cum cassidibus equitum specie ac simulatione collibus circumvehi iubet."

166. *Pro* occurs some 71 times, as follows:

(1) *Pro,* "before," "in front of," "of place" where the idea of defence is also not remote, as in "pro castris exercitum, copias collocare," V, 15, 3; VII, 68, 1; "constituere," I, 51, 1; II, 8, 5; IV, 35, 1; VII, 70, 2.

Once each with

"Dimicare, pugnare," "proelio contendere," "copias habere," "sese contendere," "sese ostendere," "considere," "excubare," "copias suas producere," "pro portis esse," IV, 32, 1.

Similarly in VII, 71, 8 ("pro oppido"); VII, 70, 5 ("pro vallo"). We find *ante,* denoting place, where we might expect *pro,* 9 times. I, 21, 3, "omnem equitatum ante se mittit"; II, 32, 4, "fossa erat ante oppidum." So also in VI, 37, 8; VII, 11, 5; VII, 79, 4; VII, 25, 2; VII, 69, 3; VII, 73, 5; VII, 73, 9.

167. (2) *Pro,* "for," "instead of."

I, 21, 2; "Labienum legatum pro praetore." Also in I, 22, 4; I, 26, 3; III, 13, 5; III, 13, 6; III, 18, 3; III, 29, 1; IV, 17, 9; V, 12, 4; VI, 9, 7; VI, 10, 7; VI, 27, 3; VI, 28, 6; VII, 51, 1; "habere aliquem non pro amico sed hoste," I, 44, 11; "habere pro explorato," VI, 5, 3; "pro certo proponere, VII, 5, 6.

168. (3) *Pro* "in proportion to," etc., *in relation to.*

I, 2, 5; I, 42, 3; I, 51, 1; II, 25, 3; III, 9, 3; III, 13, 7; V, 7, 7; V, 8, 1; V, 25, 2; V, 27, 2; VII, 41, 8; VII, 52, 4.

"Funera sunt pro cultu Gallorum magnifica"; VI, 19, 4; VII, 56, 4; VII, 54, 1; "pro loci natura," VII, 75, 5.

169. (4) *Pro,* "in return for," etc., *in payment of.*

"Ulcisci aliquem pro scelere aliquo," I, 14, 5; 5, 38, 2. So also in I, 30, 2; I, 43, 4; V, 27, 2; V, 54, 4; VI, 16, 2; VI, 16, 3; VI, 34, 8; VII, 27, 2; VII, 76, 1.

170. (5) *Pro* "in behalf of," etc.

"Locutus est pro his Diviciacus Aeduus," I, 31, 3. Similarly in II, 14, 5; VII, 19, 5; VII, 39, 2.

Prae occurs but twice as a preposition: (a) *In comparison with:* II, 30, 4, "Gallis prae magnitudine corporum," etc.

(b) *On account of,* of the hindering cause, and with negatives, VII, 44, 1.

172. *Sine.* This preposition occurs 56 times; most frequently in the phrases "sine causa," "sine periculo."

Sino is followed by *ullo* 6 times. The litotes "non sine" is found three times. I, 7, 3, "sine ullo maleficio iter per provinciam facere." Similarly in I, 9, 4; I, 19, 5; III, 24, 2; VII, 20, 12; IV, 8, 2; V, 29, 5.

Clam and *coram* are used only adverbially. *Absque* and *tenus* are not found in the *Bellum Gallicum.*

Prepositions with the Accusative and the Ablative

173. *In* with the accusative.

In with the accusative occurs nearly 300 times and shows a wide diversity of uses. Like the preposition *ex* it is used often in phrases that occur but once. To be noted, also, is the phraseological use with such words as *deducere, redigere, recipere.* Here, as with the other preposition, the original meaning of "in" is often lost, but the different uses may be learned as the opportunity presents itself.

174. (1) *In,* "towards," "upon," etc. The uses of *in* in this connection may be classified as follows:

"Impetum facere in aliquem," 12 times; "tela conicere in aliquem, 8 times; "hoc (bono, inimico) in aliquem esse (videri) animo," I, 6, 3; V, 4, 4; 41, 5; "pila in hostes immittere," V, 44, 6; VI, 8, 5; "sua in illos merita exponit," VII, 54, 3; "proponit," 71, 3; "uti misericordia in aliquem, sua clementia ac mansuetudine," II, 14, 5; 28, 3; "quantum in se facinus ad-

misissent," III, 9, 3; "signa conversa in hostem inferre," II, 26, 1; "ferre aquilam in hostes," IV, 25, 4.

175. (2) *In* in such expressions as

"In Segusiavos exercitum ducet," I, 10, 5, instead of "in fines Segusiavorum." This occurs 34 times.

176. (3) *In* with the accusative in statements of measure or extent, as "in longitudinem," when the adjective is more common in English. Beginners frequently learn such expressions as "fossa pedes trecentos longa est," "sex pedes alta," but in Cæsar the adjectives are rarely ever used. Instead we find *in* with the accusative of *longitudinem, latitudinem* or *altitudinem.*

The adjectives occur as follows: "longus," VII, 73, 9; "altus," VII, 24, 1; VII, 73, 2; "latus," VII, 24, 1; VII, 72, 3; "acclivis," III, 19, 1.

The construction with *in* and the substantive is much more frequent and occurs in I, 2, 5; VI, 29, 4; VII, 69, 3; VII, 70, 1; VII, 79, 2; V, 13, 6; VII, 23, 1; VII, 46, 3; I, 2, 5; II, 7, 4; II, 8, 3; II, 17, 4; II, 29, 3; 7, 73, 5; I, 8, 1; II, 5, 6; VII, 8, 2; VII, 69, 5; III, 13, 4.

177. (4) *In* with the accusative joins together two substantives —

(a) Substantives denoting inclination or aversion — I, 19, 2; I, 42, 3; I, 43, 4; V, 4, 3; V, 5, 4; V, 25, 2; V, 27, 2; VII, 71, 3.

(b) Verbal substantives in which the verbal idea is strong, as: "despectus in mare," "in campum," "in castra," III, 14, 9; VII, 45, 4; VII, 79, 3. Also in IV, 21, 3; V, 2, 3; V, 13, 2.

178. (5) The phraseological use of *in* with *venire* is worthy of note:

"Venire in spem," I, 18, 9; with the genitive of the gerund, III, 6, 2. See also I, 42, 3; VII, 12, 5; VII, 30, 4; III, 17, 5; V, 49, 7; IV, 12, 2; IV, 37, 4; VI, 5, 4; VI, 3, 2; VI, 9, 6; II, 13, 2; II, 15, 1; IV, 22, 2; I, 28, 5. "Venire in colloquium," I, 35, 2; "in suspicionem venire," VI, 19, 3. The expression "venit mihi in mentem" occurs neither in Cæsar nor in Nepos.

179. (6) *In*, "for," "upon," "on," of time.

"In tertium annum profectionem lege confirmant," I, 3, 2; "in annos singulos," V, 22, 4; VI, 22, 2; "in perpetuum," IV, 34, 5; V, 38, 2; V, 39, 4. Similarly, in I, 20, 6; I, 30, 4; I, 53,

7; III, 16, 4; IV, 29, 4; IV, 30, 2; VI, 1, 3; VII, 11, 5; VII, 16, 2; VII, 41, 4.

180. (7) *In* used distributively.

"Dividere in," I, 1, 1; I, 12, 4; III, 1, 6; VI, 11, 5; VI, 43, 4; VII, 34, 1.

"Distribuere in," V, 24, 1; VI, 32, 3; VII, 19, 3.

"In omnes partes dimittere," IV, 19, 2.

"Rhenus in plures defluit partes," IV, 10, 3.

181. (8) *In* used to indicate manner.

"Mirum in modum," I, 41, 1; "in servilem modum," VI, 19, 3; "in speciem," V, 51, 4; "in quincuncem disponere," VII, 73, 5; "in orbem consistere," 5, 33, 3.

182. (9) *In* with *deducere,* as: "deducor in eum casum," II, 31, 6; "deducere rem in summum periculum, V, 31, 1; VII, 50, 4. See also VII, 54, 4; VII, 63, 5.

183. (10) *In* with *redigere:* "in provinciam," I, 45, 2; VII, 77, 16; "in dicionem potestatemque populi R.," II, 34, 1; "in potestatem," VII, 13, 3; "in servitutem," II, 14, 3.

184. *In* with the ablative.

In with the ablative occurs in the *Bellum Gallicum* 293 times. The remarks for "*In* with the Accusative" are also applicable here. While there are many individual uses of "in" with the ablative that must be learned as occasion affords the opportunity, yet the following classification will be found to be helpful:

185. (1) In answer to the question "where" with the following verbs —

"Ponere," 22 times; "collocare," 15 times; "statuere," 11 times; "consistere," 21 times; "considere," 7 times; "disponere," 5 times; "exponere," IV, 23, 2; "deponere," IV, 9, 2; VI, 41, 1.

Imponere with the adverb *eo* instead of *in* with the ablative occurs in I, 42, 5; I, 51, 3.

The phraseological use of *positum esse in aliqua re,* which occurs 8 times and indicates that of which anything consists, or upon which it depends, is worthy of note. "Ponere omnem salutem in virtute, in celeritate"; III, 14, 8; III, 21, 1; V, 29, 6; V, 34, 2; V, 39, 4; V, 48, 1; VII, 40, 2; VII, 25, 1.

186. (2) *In* with the verb *esse.*

"Esse in armis," 10 times; "in eadem causa esse," IV, 4, 1; "in venationibus esse," IV, 1, 8; "rem esse in angusto," II, 25, 1;

See also VII, 35, 2; V, 48, 2; VI, 39, 1; VII, 41, 2; V, 3, 3; VII, 5, 2; VI, 4, 2; VI, 4, 5; I, 32, 5; V, 3, 7; VI, 38, 3; IV, 32, 1; VII, 24, 5; II, 26, 5; VI, 38, 2.

187. (3) *In* with the ablative with names of people instead of names of the country occurs 24 times.

188. (4) *In*, indicating the circumstances under which anything happens = " in spite of," etc., *in the face of*, etc.

" Caesarem in tantis dissensionibus ad exercitum venire non posse," VII, 1, 2.

See also VII, 20, 9; VII, 26, 4; VII, 52, 2; I, 27, 4; I, 33, 2; III, 8, 1; III, 26, 4; VI, 7, 9; VI, 42, 1.

Here belong also the following ablatives of the gerund and gerundive:

" Galli mobiles in conciliis capiendis," IV, 5, 1. Similarly, I, 18, 10; II, 21, 6; II, 28, 2; IV, 27, 4; V, 19, 3; V, 33, 2; V, 50, 5; VI, 34, 3; VII, 46, 4; VII, 56, 1; VII, 77, 7.

189. (5) *In numero.*

" Aliquo in numero esse," III, 7, 4; III, 27, 1; VII, 75, 4. See also I, 28, 2; VI, 32, 1; VI, 23, 8; VII, 39, 1. Cf. also " in his fuit," I, 53, 3; *in his* alone = " among these," I, 16, 5; II, 25, 1; IV, 12, 3; V, 4, 2; V, 53, 6; VII, 3, 1.

190. (6) *In* following *manere* and similar verbs.

" Permanere in eadem tristitia," I, 32, 3; " In eo concilio," VI, 40, 6.

See also I, 36, 5; VII, 4, 5; VII, 10, 3; III, 8, 4; IV, 21, 6; VI, 8, 9; VI, 14, 3; VI, 24, 4; VII, 26, 4; V, 36, 4.

191. (7) *In* with the verb *versari.*

" In proelio," I, 48, 5; II, 1, 3; VI, 16, 2. Similarly, with other substantives: *opere,* VII, 27, 1; VII, 77, 11; *castris,* II, 24, 2; *periculo,* II, 26, 5; VI, 16, 2; *bello,* VI, 15, 2. Note the active use of this verb in V, 44, 14.

192. (8) *In circuitu,* I, 21, 1; II, 29, 3; II, 30, 2; V, 13, 7; V, 42, 5.

193. *Sub.* (1) *Sub* with the accusative.

(a) Of extent. " Sub iugum mittere," I, 7, 4; I, 12, 5. *Sub,* " towards," or " against," I, 24, 4; V, 29, 4.

(b) Of time, " towards " = " shortly before." " Sub vesperum," II, 33, 1; V, 58, 3; VII, 60, 1; " sub occasum solis," II, 11, 6; " sub lucem," VII, 61, 3; VII, 83, 7.

(2) With the ablative.

(a) Of space, "under," "at the foot of," "at," etc.

"Gallia sub septentrionibus posita est," I, 16, 2; "sub monte considere," I, 21, 1; I, 48, 1.

See the examples also in VII, 36, 5; VII, 49, 1; VII, 48, 2; VII, 69, 5; V, 43, 5; VI, 37, 2; V, 37, 2; V, 8, 2; V, 18, 3; V, 16, 1; II, 17, 2; III, 24, 3; III, 29, 2; III, 16, 4; VI, 36, 3; VI, 40, 4; I, 31, 7; V, 24, 4; V, 39, 1; VI, 10, 1; VII, 75, 2.

It will thus be observed that *sub* does not *always* mean "under." *E. g.*, in *sub castris eius vagabantur*, the meaning is, "in the neighborhood of." In *sub oculis omnium pugnatur*, V, 16, 1, the meaning "before" would be better than "under." And so in many other cases.

(b) Temporal. V, 13, 3, "sub bruma."

194. *Super* and *subter* do not appear in the *Bellum Gallicum*. *Subter* is not found also in the *Bellum civile*.

SEQUENCE OF TENSES

195. In the Sequence of Tenses in the *Bellum Gallicum*, as elsewhere, there are two varieties to consider:

(a) Sequence after Principal Tenses;

(b) Sequence after Historical Tenses.

The *Bellum Gallicum* shows 840 examples of these, divided as follows:

196. (1) After an imperfect, pluperfect, and historical perfect, as well as after all gerunds, supines, infinitives and participles depending on them, a subjunctive imperfect or pluperfect follows 630 times.

197. (2) After the Principal Tenses a subjunctive present or perfect follows 210 times.

From this it will be observed that the subjunctive in the Historical tenses, as compared with the subjunctive in the Principal tenses, is as three to one. The mere fact that Cæsar affords 840 examples of the sequence of tenses ought to be sufficient to familiarize pupils with that feature of Latin grammar. And yet, as a rule, the prose work of pupils who have read considerably more Latin than the *Bellum Gallicum* shows, frequently, a lack of knowledge on this subject.

Let us examine these examples and see how they can be classi-

fied so as to gain a clear understanding of this important construction. Notice:

198. (1) How rarely the perfect — except in *oratio obliqua* — is followed by the subjunctive present or perfect: I, 26, 2; VII, 40, 4; VII, 61, 5 (reading disputed); VII, 80, 1. In VII, 20, 12, the present is dependent upon a logical perfect.

199. (2) In the *oratio obliqua,* despite the preceding historical tenses, Cæsar frequently retains the subjunctive of the principal tenses. This is true in the following sentences:

(a) In conditional sentences: I, 34, 2; I, 40, 14; IV, 7, 3; VII, 20, 7; VII, 66, 5. In the midst of another sentence, VII, 74, 1.

(b) In relative sentences that are not final.

(*a*) After a present infinitive dependent upon a historical tense:

(1) The present subjunctive: IV, 8, 2; VII, 29, 6;

(2) The perfect subjunctive: I, 31, 8; II, 4, 2; IV, 8, 2.

(*b*) After a perfect infinitive, the present subjunctive, II, 3, 4.

(*c*) After a perfect infinitive, the perfect subjunctive, I, 40, 7; I, 40, 12; II, 4, 7; V, 27, 3; VII, 5, 5; VII, 20, 4; VII, 20, 6; VII, 29, 2.

(*d*) Note the example in VII, 15, 4, "procumbunt Bituriges, ne pulcherrimam urbem, quae ornamento sit civitati, succendere cogerentur."

(c) Causal sentences.

(*a*) Dependent upon a present infinitive after a historical tense, II, 4, 4; VII, 20, 6; V, 27, 7; V, 28, 4.

(*b*) Dependent upon a perfect infinitive, V, 27, 4.

(*c*) Subordinate clause in an indirect question, VI, 31, 1.

(d) Temporal clauses in the subjunctive.

The perfect after a perfect infinitive: "cum," VI, 25, 4; "posteaquam," VI, 10, 4; "quamdiu," I, 17, 6; "priusquam," III, 18, 7.

(e) In a sentence of comparison.

"Alio loco, alio tempore atque oportuerit fratrem a fratre esse renuntiatem," VII, 33, 3. "Here the subjunctive perfect is at variance with the usage of that period because in the direct discourse we should have *oportuit.*" On the same basis we have *potuerit,* I, 17, 6; I, 31, 8; and IV, 8, 2; V, 27, 4, *non potuerit.*

200. (3) In result clauses the subjunctive imperfect follows regularly the historical tenses 112 times. A pluperfect follows a pluperfect twice, I, 43, 7; VII, 54, 4. After a present the subjunctive present follows regularly 13 times. The subjunctive perfect after a logical perfect is found in VI, 18, 3.

After the historical present there is a difference of usage; *e. g.*, in I, 11, 3, a Principal Tense follows, by representation, the historical tense of the Principal Clause. So we might cite: I, 14, 7; II, 3, 5; II, 21, 5; III, 15, 5; IV, 16, 7; V, 15, 1; V, 54, 4; VII, 17, 3; VII, 29, 6; VII, 37, 4.

201. (4) German scholars are at variance whehn it comes to formulating rules for the sequence after the historical present.

The principal work on the subject has been done by Hug in his "Die Consecutio temporum des Praesens historicum zunächst bei Caesar," and by Hoffman, in his work "Die Zeitfolge nach dem Praesens historicum," in his "Studien auf dem Gebiete der lateinischen Syntax," Wien, 1884, who arrive at very divergent conclusions as to the laws governing the usage.

Heynacher's position in regard to both is as follows:

The Temporal Sentence

202. He agrees with Hug when he says that "the temporal causal *cum* of narration retains the historical tense of the subjunctive after a historical present in the Principal Clause." The sentence with *cum* precedes the Principal Clause in I, 7, 1; I, 9, 2; I, 11, 2; I, 13, 2; I, 16, 6; I, 20, 5; I, 22, 2; II, 2, 2; II, 6, 4; III, 5, 1; III, 11, 5; IV, 11, 1; V, 1, 6; V, 2, 2; V, 22, 4; V, 36, 1; V, 44, 4; V, 47, 4; V, 58, 6; VI, 2, 2; VI, 3, 4; VI, 29, 4; VII, 5, 4; VII, 7, 4; VII, 9, 5; VII, 12, 3; VII, 32, 2; VII, 32, 3; VII, 40, 4; VII, 61, 1; VII, 87, 1.

The Principal Clause precedes in V, 31, 4.

Priusquam with the subjunctive imperfect precedes the Principal Clause in the historical present in I, 19, 3; IV, 21, 1; VI, 4, 1. It follows in VII, 9, 5. *Priusquam* with the subjunctive present in *oratio obliqua* precedes in V, 27, 9; V, 56, 5; VII, 1, 6; VII, 71, 1.

Final Sentences

203. Two kinds of final sentences are to be noted:

(a) Real Purpose Clauses;

(b) Final Object Clauses.

The question arises: is the sequence after the historical present the same in each?

204. Let us examine first the Purpose Clause. This shows four different uses:

(a) The subjunctive imperfect *preceding* a historical present, I, 13, 1; IV, 6, 1; VI, 3, 4; VI, 29, 2; VII, 11, 3; VII, 12, 3; VII, 31, 4; VII, 45, 7.

(b) The subjunctive imperfect *following* a historical present, I, 5, 3; I, 7, 3; I, 9, 2; IV, 11, 6; V, 50, 3; VI, 33, 5; VII, 9, 4; VII, 11, 3; VII, 45, 3; VII, 75, 1; VII, 76, 4.

(c) The subjunctive present *preceding* a historical present, VII, 74, 2; VII, 66, 6. VI, 7, 8, "quo facilius hostibus timoris det suspicionem, maiore strepitu et tumultu, quam populi R. fert consuetudo, castra moveri iubet."

(d) The subjunctive present *following* a historical present, I, 20, 6, "Dumnorigi custodes ponit, ut, quae agat, quibuscum loquatur scire possit." See also VI, 34, 8; VII, 4, 10; VII, 42, 4; II, 5, 2; III, 11, 3; V, 48, 4; VI, 5, 2; VI, 29, 5; VII, 70, 2; VII, 90, 5; I, 8, 2; VII, 5, 2; VII, 14, 9; VII, 70, 7.

Here also should be included 16 final relative clauses, as follows: I, 6, 4; I, 15, 1, III, 11, 4; III, 18, 8; IV, 21, 5; V, 1, 7; V, 1, 9; V, 20, 3; V, 49, 2; VI, 9, 6; VI, 32, 2; VI, 39, 2; VII, 1, 5; VII, 10, 3; VII, 61, 5.

From the foregoing it is easy to see that no fixed law can be laid down. Under (a) there are 8 examples in which the imperfect subjunctive preceded a historical present; under (b) 11 examples in which the imperfect subjunctive follows a historical present. This is evidence enough to refute the statement of Hug that "when the subordinate clause precedes the Principal Clause the imperfect must be used."

If, on the other hand, we compare these 19 examples of final clauses with the imperfect with the 34 examples in the present subjunctive, we are forced to reject Hoffman's rule, which says that final clauses, with a few exceptions, must be put in the present subjunctive after a historical present.

206. Final Object Clauses. Here, also, there are 4 different types:

(a) An imperfect subjunctive following a present historical only in I, 3, 5. In II, 12, 5, "petentibus Remis ut conservarentur impetrant," it might be questioned whether *conservarentur* depends upon the participle or upon the verb *impetrant* that follows.

(b) An imperfect subjunctive following a historical present: I, 3, 4; III, 8, 4; V, 1, 1; VII, 15, 4; I, 47, 1; III, 5, 3; V, 58, 4; VI, 1, 2; VII, 86, 2; VII, 6, 4.

(c) The present subjunctive preceding a historical present: I, 9, 4, "obsidesque uti inter se dent, perficit." See also III, 21, 3; V, 37, 1; VI, 40, 2; VII, 2, 2.

(d) The present subjunctive following a historical present. Here we find at least seventy references: I, 5, 4; I, 7, 3; I, 9, 4; I, 17, 2; I, 19, 5; I, 20, 5; I, 20, 6; I, 31, 16; II, 2, 3; II, 14, 5; III, 8, 5; III, 11, 2; III, 18, 2; IV, 7, 4; IV, 21, 2; IV, 21, 8; V, 11, 4; V, 20, 3; V, 22, 1; V, 22, 5; V, 27, 7; V, 31, 1; V, 34, 3; V, 36, 1; V, 36, 3; V, 38, 2; V, 41, 8; V, 45, 3; V, 46, 3; V, 46, 4; V, 48, 3; V, 48, 5; V, 48, 6; V, 49, 3; V, 49, 7; V, 58, 4; VI, 8, 1; VI, 9, 7; VI, 10, 1; VI, 10, 2; VI, 10, 3; VI, 29, 5; VI, 33, 5; VI, 37, 10; VII, 1, 6; VII, 2, 2; VII, 4, 4; VII, 4, 5; VII, 8, 3; VII, 8, 4; VII, 9, 2; VII, 10, 3; VII, 14, 2; VII, 21, 2; VII, 32, 2; VII, 37, 2; VII, 38, 6; VII, 38, 10; VII, 39, 3; VII, 40, 5; VII, 45, 1; VII, 48, 8; VII, 63, 4; VII, 63, 5; VII, 64, 3; VII, 66, 7; VII, 71, 2; VII, 71, 3; VII, 78, 1; VII, 86, 3; VII, 87, 5.

Summary

207. Of the 87 examples of a final object clause dependent upon a historical present tense, 75 are in the present subjunctive and 12 in the imperfect subjunctive. Of the 12 in the imperfect subjunctive 2 precede the Principal Clause and 10 follow it. Of the 75 in the subjunctive present 5 sentences precede the ruling clause and 70 follow it. All of which proves that it is useless to try to frame hair-splitting rules as to the effect upon the tense of the subordinate clause when it precedes or follows the Principal Clause, and suggests that teachers should thoroughly emphasize the general principles laid down in our school grammars. And yet we dare not be too dogmatic in our statements, for in Cæsar we find 75 examples of the subjunctive present follow-

ing a historical present as against 12 in the imperfect subjunctive. Cf. Allen & Greenough's Grammar where the opposite seems to be implied.

Besides the examples already cited, there remain still four other types of sentences to be considered.

208. (1) *Result Clauses.*

In Or. obl. the subjunctive present follows a historical present in I, 14, 6; I, 20, 5; I, 31, 14; IV, 7, 3; IV, 16, 7; V, 27, 4; V, 41, 5; VII, 19, 5; VII, 32, 5; VII, 42, 2. In I, 5, 1, we have an explanatory clause, "post eius mortem nihilo minus Helvetii id quod constituerant facere conantur ut ex finibus suis exeant." We find also three consecutive clauses with the imperfect subjunctive following a historical present: V, 11, 2; V, 51, 5; V, 53, 1.

209. (2) *Relative Clauses.*

(a) For final relative sentences see under Purpose Clauses.

(b) Consecutive relatives. In VII, 1, 5, the subjunctive present occurs. In VI, 36, 2 the imperfect subjunctive follows a present participle ("expectans"="cum expectaret").

(c) A general relative sentence follows in the pluperfect subjunctive in VII, 66, 7.

(d) Causal.

(*a*) In VII, 1, 3, an imperfect subjunctive precedes a historical present.

(*b*) In VI, 36, 1, a pluperfect subjunctive likewise precedes.

(e) Twenty-five relative clauses in Or. obl. stand in the present or perfect after a historical present in the Principal Clause. The present subjunctive follows the ruling Principal Clause in I, 14, 6; I, 44, 6 (explaining *quod*); II, 2, 3; IV, 21, 8; V, 41, 6; VII, 14, 6. The perfect subjunctive follows a historical present of the Principal Clause in IV, 8, 2; V, 34, 4; V, 38, 2. The pluperfect subjunctive follows a historical present in I, 47, 1; VII, 66, 7. The pluperfect precedes a historical present in I, 42, 1. The imperfect subjunctive precedes a historical present in VII, 75, 1; VII, 90, 2.

It may be added, in conclusion, that five *quin* clauses in Or. obl. show the present subjunctive following the historical

present, I, 17, 4; I, 31, 15; III, 18, 4; IV, 7, 3; V, 2, 2; VI, 39, 3; while in VII, 66, 6 the subordinate clause precedes.

210. (3) *Causal Sentences.*

(a) *Cum* = "since," with an imperfect subjunctive preceding a historical present does not occur. In I, 40, 10 the imperfect subjunctive follows a present infinitive dependent upon a preterit. In the present subjunctive it precedes in I, 14, 6; V, 27, 11; VII, 19, 4; in the perfect subjunctive it precedes, I, 16, 6.

(b) *Quod* with an imperfect subjunctive preceding a historical present also does not occur. In I, 3, 6, after a present, we find *obtenturus esset.* On the other hand, in I, 16, 6, "quod sit destitutus queritur." Outside of these two examples the present or perfect subjunctive always occurs. See I, 16, 6; I, 18, 3; I, 18, 8; I, 44, 10; IV, 7, 3; VI, 14, 4; VII, 1, 7; VII, 14, 3; VII, 14, 6; VII, 15, 5; VII, 32, 3.

(c) *Quoniam* with the present subjunctive precedes a present in VI, 7, 6; VI, 40, 2; VII, 2, 2; VII, 64, 2; VII, 89, 2. With the subjunctive perfect it precedes in V, 27, 7. These belong to Or. Obl.

211. (4) *Indirect Questions.*

(a) Twenty-four indirect questions with the present or perfect precede the Principal Clause in the historical present.

(*a*) The present subjunctive is found in I, 17, 5; I, 20, 6; I, 21, 2; III, 18, 2; III, 18, 3; III, 26, 1; V, 2, 3; V, 56, 5; VI, 7, 8; VI, 10, 3; VI, 31, 1.

(*b*) The perfect subjunctive is found in I, 35, 7; I, 37, 6; I, 39, 1; VII, 4, 8; VII, 5, 6; VII, 11, 5; VII, 37, 7; VII, 41, 2; VII, 45, 7; VII, 45, 8; VII, 83, 1; VII, 83, 5; VII, 85, 1.

(b) Thirteen examples in the present or perfect follow a Principal Clause in the historical present. These are: I, 15, 1; II, 5, 2; V, 27, 9; V, 48, 2; V, 49, 8; V, 54, 5; VII, 14, 8; VII, 19, 4; VII, 87, 5; I, 17, 6; I, 19, 4; V, 2, 3; VII, 31, 4.

(c) The subjunctive imperfect precedes a historical present in V, 22, 4; and in IV, 21, 9, we find the same true with reference to the pluperfect subjunctive.

(d) Seven indirect questions in the imperfect subjunctive follow a historical present or its equivalent. Of these six (III, 6, 1; IV, 14, 2; V, 47, 5; VI, 29, 4; VI, 37, 4; VII, 15, 3), follow directly after the ruling clause, while in V, 50, 3, a clause intervenes between the ruling verb and the indirect question.

Note. A direct question in the imperfect subjunctive in Or. obl. follows a present in I, 44, 8.

212. From a study of the foregoing, critics have attempted to make two kinds of indirect questions:

(1) Those that may be considered as belonging in a sense to the subject of the Principal Clause, as I, 17, 5.

(2) Those which may be considered as part of the historical report, as, IV, 21, 9.

The former are found in the present or perfect subjunctive and may either precede or follow the governing verb. The latter occur in the imperfect or pluperfect subjunctive. A few precede, the majority follow the governing verb.

Summary

213. (1) The subjunctive present or perfect depending upon a historical present occur in the *Bellum Gallicum* as follows:

Actual purpose clauses, 34 times; final object clauses, 75 times; consecutive clauses, 13; relative clauses of *oratio obliqua,* 38 times; *quin* clauses in *oratio obliqua,* 7 times; causal clauses, mostly *oratio obliqua,* 22 times; indirect questions, 37 times; clauses with *priusquam,* 7 times; total, 233 times.

214. (2) The subjunctive imperfect or pluperfect depending upon a historical present occur:

Actual purpose clauses, 19 times; final object clauses, 12 times, consecutive clauses, 4 times; general relative clauses, 1 time; causal relative clauses, 2 times; relative clauses of *oratio obliqua,* 5 times; causal clauses of *oratio obliqua,* 1 time; indirect questions, 9 times; *cum* clauses, 32 times; clauses with *priusquam,* 4 times; total, 88 times.

215. From these figures the following inferences may be drawn:

(1) That no exact rule capable of literal application, as *e. g.,* in mathematics, can be formulated for sequence after a historical present. Either a principal or a historical tense may follow it.

(2) The question as to whether the subordinate clause precedes or follows the principal clause is of little consequence.

(c) *Cum* temporal in narration follows the rule taking the imperfect and pluperfect subjunctive.

216. *Notes.* (1) The present periphrastic subjunctive occurs I, 17, 4; I, 3, 6; III, 9, 6; V, 47, 5. The pluperfect subjunctive of the periphrastic occurs in I, 40, 14.

(2) Instead of the future infinitive we find the circumlocution *fore* or *futurum esse ut* when the verb that would take the future infinitive has no supine. See I, 42, 3; IV, 35, 1; VII, 32, 5; II, 17, 3.

(3) The future infinitive passive occurs in V, 36, 2, "nocitum iri"; VII, 11, 4, "ductum iri"; VII, 66, 5, "spoliatum iri." In I, 31, 11 and I, 20, 4, we find a circumlocution, viz., *futurum esse ut pellerentur.*

SUBJUNCTIVE MOOD

217. Thus far all references to the subjunctive have been to those found in subordinate clauses. Of these there is a large number in Cæsar. The independent subjunctive in Principal Clauses occurs on the other hand very rarely.

Two types are to be observed:

(a) The hortatory subjunctive; VII, 38, 8 and VII, 77, 7.

(b) The imperative subjunctive, VII, 77, 4.

In the *Bellum Gallicum* the following subjunctives do not occur at all: the potential, the optative, the asseverative ("ita me di ament," etc.), the concessive and the dubitative subjunctive in *oratio recta.*

From the above it is plain that the teacher need not burden the second year pupil with a host of distinctions about the subjunctive mood in independent sentences. As it occurs but three times in Cæsar, that may be put off until the pupil begins to read Cicero.

SUBORDINATING CONJUNCTIONS

These may be divided into six classes:

I. *The Temporal Conjunctions.*

218. *Dum* = "during," "while": I, 27, 4; I, 39, 1; I, 46, 1; III, 17, 1; IV, 22, 1; IV, 32, 1; IV, 34, 3; V, 22, 1; V, 35, 7; V, 37, 2; V, 44, 12; VI, 7, 1; VII, 37, 1; VII, 42, 1; VII, 57, 1; VII, 66, 1; VII, 75, 1; VII, 82, 3.

(b) *Dum* = "so long as',, etc., "while." VII, 50, 6, "proinde abite, dum est facultas"; VII, 82, 1; VII, 77, 2.

(c) *Dum,* temporal, "until." I, 7, 6; I, 11, 6; IV, 13, 2; IV, 23, 4; VII, 23, 4.

Donec does not occur in Cæsar.

Quoad, "so long as": IV, 12, 5; V, 17, 3, with the perfect indicative.

(b) Temporal = *until;* with the pluperfect subjunctive; IV, 11, 6; V, 24, 8.

Quamdiu, "as long as," I, 17, 6.

Postquam, with the perfect indicative: I, 24, 1; I, 27, 3; II, 5, 4; III, 15, 2; VI, 9, 1; VII, 58, 2.

Posteaquam.

(a) With the perfect indicative: I, 46, 4; V, 3, 5; V, 6, 4; V, 32, 1; VII, 82, 1; IV, 37, 4.

(b) With the pluperfect subjunctive in *oratio obliqua,* I, 31, 5; IV, 19, 2.

(c) With the subjunctive perfect in *oratio obliqua,* VI, 10, 4.

Ubi. (a) With the perfect indicative: I, 5, 2; I, 7, 3; I, 8, 3; I, 12, 2; I, 16, 5; I, 28, 1; I, 43, 4; I, 49, 1; I, 50, 2; II, 6, 2; II, 8, 3; II, 10, 4; II, 19, 6; II, 25, 1; II, 30, 3; II, 31, 1; III, 14, 1; III, 14, 2; III, 18, 3; III, 18, 5; III, 21, 3; III, 23, 7; III, 24, 1; IV, 10, 4; IV, 19, 4; IV, 25, 1; V, 9, 1; V, 56, 1; V, 58, 3; VI, 8, 6; VI, 23, 7; VII, 3, 1; VII, 12, 1; VII, 26, 4; VII, 28, 2; VII, 51, 3.

(b) With the present indicative: II, 9, 2.

(c) With the pluperfect indicative: IV, 26, 2.

Ubi primum with the perfect indicative: IV, 12, 1; VII, 51, 3.

Simul, "as soon as." With the perfect indicative, IV, 26, 5.

Simul atque, IV, 27, 1; V, 3, 3; VII, 12, 5.

Priusquam

(a) With the imperfect subjunctive: I, 19, 3; II, 12, 1; III, 10, 3; III, 26, 3; IV, 7, 4; IV, 14, 1; IV, 21, 1; VI, 3, 2; VI, 4, 1; VI, 5, 5; VI, 30, 2; VI, 37, 2; VII, 9, 5; VII, 36, 7; VII, 56, 1; VII, 82, 4.

(b) With the imperfect subjunctive: I, 43, 7; II, 32, 1 (*oratio obliqua*); IV, 12, 2; VII, 36, 1.

(c) With the present subjunctive: V, 27, 9; V, 56, 5; VII, 1, 6; these are subordinate clauses in *oratio obliqua.*

(d) With the perfect subjunctive: III, 18, 1; V, 58, 4.

(e) With the perfect indicative: I, 53, 1; VII, 25, 4; VII, 47, 3.

Cum. This conjunction presents a variety of uses in the *Bellum Gallicum* and authorities are by no means agreed as to the *cum* clauses. We shall therefore not attempt to classify the different uses of *cum,* but simply cite the references:

(a) With the present indicative: IV, 12, 3; VI, 13, 2; VI, 15, 1; VI, 23, 4; VI, 7, 2; VI, 8, 1.

(b) With the perfect indicative: VI, 12, 1; IV, 33, 1; VI, 17, 3; VI, 18, 3; VI, 19, 3; VI, 27, 4; VI, 27, 5.

Cum primum, III, 9, 2.

(c) *Cum* with the imperfect indicative, I, 40, 5.

(d) *Cum* with the pluperfect indicative: III, 14, 6; III, 15, 1; IV, 14, 4; V, 19, 2.

(e) With the pluperfect subjunctive: I, 25, 3; II, 20, 1; III, 12, 1; III, 13, 9; VII, 16, 3; V, 16, 2.

(f) *Cum,* temporal concessive.

With the subjunctive: I, 14, 6; I, 16, 6; I, 26, 2; I, 43, 5; II, 29, 1; III, 17, 5; IV, 3, 4; IV, 12, 1; IV, 24, 3; IV, 27, 5; V, 18, 5; V, 26, 2; V, 40, 7; V, 43, 4; V, 53, 1; VII, 24, 1; VII, 33, 3; VII, 62, 4.

The subjunctive with *cum* required through *oratio obliqua* occurs 245 times in the *Bellum Gallicum.*

2. *Final and Consecutive Conjunctions.*

Ut, ne quo, quominus quin, followed by the subjunctive.

219. *Ut.*

(1) *Ut,* "so that," introducing consecutive clauses.

(a) After expressions that contain the word "so" or its equivalent.

(*a*) Adjectives:

Tantus, I, 20, 5; I, 33, 5; I, 39, 1; I, 48, 7; II, 3, 5; II, 21, 5; II, 27, 1; III, 35, 1; III, 15, 3; III, 17, 6; IV, 16, 7; IV, 17, 4; IV, 28, 2; IV, 33, 3; V, 43, 4; V, 54, 4; V, 54, 5; V, 55, 4; V, 58, 1; VI, 1, 3; VI, 12, 3; VI, 27, 4; VI, 35, 9; VI, 38, 5; VI, 41, 2; VII, 46, 5; VII, 76, 2.

Is (in the sense of *talis*), I, 50, 4; IV, I, 10; V, 18, 5; V, 43, 4; VI, 12, 9; VI, 43, 4.

Hic, I, 35, 2; I, 43, 8; III, 22, 2; IV, 23, 3; V, 41, 5; V, 43, 5.

(*b*) Adverbs:

Ita, I, 11, 3; I, 2, 1; I, 13, 6; I, 14, 7; I, 15, 5; I, 38, 5; I, 52, 3; IV, 12, 2; IV, 23, 3; IV, 33, 2; IV, 33, 3; VII, 73, 6.

Sic, I, 38, 4; II, 32, 4; V, 11, 2; V, 17, 2; V, 44, 14; V, 51, 4; V, 51, 5; VI, 18, 2; VI, 41, 3; VII, 17, 5; VII, 19, 2; VII, 19, 5; VII, 30, 4; VII, 37, 4.

Adeo, V, 27, 4; V, 53, 7.

Usque eo, VI, 37, 2; VII, 17, 3.

Tam, with adjectives, I, 44, 9; II, 21, 5.

Eiusmodi, III, 12, 1; III, 13, 7; III, 29, 2; V, 27, 3. *Ut,* in the same meaning but when the preceding clause does not contain one of these adverbs, is found: I, 6, 2; I, 14, 6; I, 25, 4; I, 25, 7; I, 41, 4; I, 43, 7; I, 48, 3; I, 51, 1; II, 18, 2; II, 19, 7; II, 25, 1; II, 27, 5; III, 4, 1; III, 14, 4; III, 14, 7; III, 14, 8; III, 15, 5; III, 17, 5; V, 33, 1; V, 40, VII; V, 53, 1; VI, 34, 7; VI, 43, 3; VI, 43, 5; VII, 16, 3; VII, 19, 3; VII, 23, 3; VII, 24, 4; VII, 28, 6; VII, 42, 2; VII, 54, 4; VII, 55, 10; VII, 56, 4; VII, 69, 1; VII, 72, 1; VII, 74, 1; VII, 80, 1.

Here belong also *tamen ut,* V, 15, 1; and *atque ut,* V, 53, 1.

(b) After impersonal expressions:

Futurum est, I, 10, 2; I, 20, 4; I, 31, 11; II, 17, 3.

Fore, I, 42, 3; VII, 32, 5.

Fit, I, 2, 4; I, 31, 4; II, 4, 3; III, 19, 3; V, 6, 5; VII, 24, 5; VII, 29, 4.

Accidit, III, 2, 2; IV, 29, 1; V, 23, 3; V, 33, 6; V, 39, 2; VI, 14, 4; VI, 15, 1; VI, 17, 5; VI, 30, 2.

Accedit, III, 13, 9; V, 16, 4.

Relinquitur, V, 19, 3.

Ius est, I, 36, 1.

The epexegetical *ut* occurs in I, 4, 1; I, 5, 1; I, 13, 2; I, 31, 4; IV, 35, 1; VI, 40, 6; VII, 7, 3.

220. (2) *Ut* final, "in order that," introducing purpose clauses.

(a) In pure purpose clauses: I, 3, 1; I, 5, 3; I, 7, 6; I, 9, 2; I, 13, 1; I, 20, 6; I, 22, 3; I, 25, 1; I, 39, 3; I, 40, 14; I, 42, 5; I, 52, 1; II, 8, 5; II, 9, 1; II, 40, 4; II, 28, 3; III, 19, 1; IV, 13, 5; IV, 17, 5; IV, 17, 10; IV, 19, 4; V, 8, 1; V, 10, 1; V, 30, 1; V, 50,

3; V, 57, 3; VI, 3, 4; VI, 8, 2; VI, 23, 4; VI, 29, 2; VI, 32, 5; VI, 33, 5; VI, 34, 8; VII, 4, 10; VII, 9, 4; VII, 11, 3; VII, 12, 3; VII, 20, 8; VII, 31, 4; VII, 35, 4; VII, 36, 7; VII, 42, 4; VII, 49, 2; VII, 56, 1; VII, 57, 1; VII, 74, 1.

See also IV, 2, 1; I, 30, 3; I, 48, 2; II, 9, 4; V, 49, 7; VI, 42, 3; VII, 28, 4; IV, 11, 4.

(b) Depending upon verbs:

(*a*) After verbs indicating to *care for, strive after, desire,* etc., as in VII, 87, 1; I, 41, 3; VII, 59, 4; I, 31, 2; V, 8, 3; VII, 14, 2.

(*b*) After verbs meaning to *wish, advise, command,* etc. See, *e. g.,* II, 22, 2; I, 19, 5; IV, 16, 1; II, 28, 3; II, 2, 3; I, 20, 6; VII, 8, 4; IV, 16, 5; I, 2, 1; II, 10, 5; I, 34; 1; I, 7, 3; VI, 20, 1. There are many others of these and the foregoing are simply cited as illustrative examples.

(*c*) After verbs meaning to *permit, allow,* etc., I, 28, 5; III, 18, 7; I, 45, 1; VI, 8, 1.

(*d*) After verbs indicating to *effect, do, make, bring about, obtain:* I, 13 7; II, 5, 5; IV, 2, 2; II, 11, 1; I, 9, 4; II, 12, 5; III, 22, 4.

221. *Ne,* "in order that . . . not."

(a) In purpose clauses: *in order that . . . not.* See, *e. g.,* I, 28, 4; I, 37, 4; I, 49, 1; I, 51, 2; II, 5, 2; II, 8, 4, II, 21, 6; II, 33, 1; III, 10, 2; III, 11, 3; III, 26, 2; III, 29, 1; IV, 6, 1; V, 4, 1; V, 48, 4; VI, 5, 2; VI, 9, 2.

222. (b) In final object clauses.

Here again we find a wide variety of uses. Note, *e. g.,* the following:

(*a*) After verbs indicating to *care for, strive after,* etc. See I, 13, 5; V, 57, 1; I, 31, 2; VII, 9, 2; VII, 32, 5; V, 7, 2; VII, 20, 12.

(*b*) After verbs indicating to *advise, admonish, implore, beseech.* Illustrative of these may be cited the following: VI, 37, 10; II, 21, 2; II, 31, 4; V, 38, 2; I, 46, 2; II, 32, 2; I, 51, 3; I, 26, 6; I, 20, 1; IV, 11, 1; II, 31, 4; I, 22, 3; I, 30, 5.

(*c*) After verbs of *declaring,* such as *confirmo,* VII, 66, 7; *communico,* IV, 13, 4; *nuntio,* IV, 11, 6; pronuntio, V, 34, 1; V, 34, 3; see also I, 9, 4.

(*d*) After verbs meaning to *hinder, prevent, deter:* VII, 2, 2; I, 38, 2; VII, 45, 8; I, 4, 2; I, 17, 2; I, 31, 16; VII, 56, 2; V, 22, 5; V, 58, 4; VII, 40, 5.

(*e*) After verbs of *fearing:* II, 26, 2; I, 27, 4; I, 19, 2; I, 42, 4; II, 1, 2; V, 3, 5; V, 25, 4; VII, 11, 6; VII, 28, 2; VII, 28, 6; VII, 67, 6; VII, 82, 2.

223. *Quo* with the subjunctive = *ut eo.*

(1) "Quo facilius," I, 8, 2; II, 17, 4; II, 25, 2; III, 13, 1; V, 3, 6; VI, 7, 8; VII, 5, 2; VII, 66, 2.

"Quo gravius," I, 14, 5.

"Quo diligentius," III, 16, 4.

"Quo" with comparative adjectives: VII, 11, 1; VII, 66, 6; VII, 73, 2.

"Quo" without a comparative, II, 27, 2.

"Quominus" with the subjunctive, I, 31, 7; IV, 22, 4; VII, 49, 2.

"Quin" after "non dubitare," I, 17, 4; I, 31, 15; VII, 38, 8; VII, 66, 6.

"Quin" after "non est dubium," I, 3, 6.

"Quin" after "dubitandum non existimavit," II, 2, 4.

Note also III, 2, 7; III, 24, 5; I, 4, 4; III, 18, 4; V, 2, 2; VII, 11, 8; V, 55, 1; VII, 36, 4; V, 53, 5; I, 33, 4; I, 47, 2; IV, 7, 3; II, 3, 5; VII, 44, 4.

3. *Causal Conjunctions.*

224. *Quod.*

(a) *Quod* with the indicative occurs 143 times in the *Bellum Gallicum.*

(b) *Quod* with the subjunctive has two uses.

(*a*) By attraction.

(*b*) When the treatment rests upon the authority of another. Of this there are nearly 50 cases in Cæsar.

(c) *Quod* denoting *the fact that.* In this use it is preceded by

(*a*) A substantive as in I, 53, 6; II, 20, 3.

(*b*) After a pronoun, as in III, 4, 3.

(*c*) When it is preceded by the verbs *accedit,* III, 2, 5; *accessit etiam,* IV, 16, 2.

It is used also in this way to supplement a demonstrative, I, 14, 4.

(d) "Quod" *with reference to* = *whereas.* See I, 13, 5.

Quoniam.

Quoniam with the indicative: V, 49, 6; VI, 11, 1; VII, 50, 4. With the subjunctive in *oratio obliqua,* I, 35, 2; I, 35, 4; I, 36,

3; I, 42, 1; V, 27, 7; VI, 1, 2; VI, 7, 6; VII, 64, 2; VII, 89, 2; V, 3, 5; VI, 40, 2; VII, 2, 2; VII, 72, 2.

Siquidem, VI, 36, 2.

Quare, with the subjunctive, I, 14, 2; I, 19, 1; I, 33, 2; I, 45, 1; V, 31, 5; VII, 63, 7.

4. *Conditional Conjunctions.*

225. *Si.*

(a) *Si* occurs very often in Cæsar and is used to introduce almost every kind of conditional sentence. The categories are in the main those given in the grammars.

(b) For the use of *si,* of words involving *trial, expectation,* see I, 8, 4; II, 9, 1; V, 43, 6; V, 50, 3.

(c) *Si* is also used with indefinite pronouns and adjectives. See, *e. g.,* I, 31, 12; I, 20, 4; V, 30, 2; VI, 13, 5; II, 14, 6.

(d) *Simodo* with the subjunctive, IV, 20, 2; V, 31, 2.

(e) *Sin,* "but if," I, 13, 4.

Sin autem, V, 35, 4.

(f) *Si minus,* II, 9, 5; I, 47, 1.

(g) *Si non* negatives a single word in the sentence: It negatives the verb in I, 17, 3; I, 35, 4; I, 36, 2; I, 36, 5; V, 48, 5; V, 50, 3; VII, 77, 11; VII, 77, 13; VII, 86, 2. It negatives another single word in I, 31, 12; IV, 16, 4; V, 29, 7.

5. *Concessive Conjunctions.*

226. *Etsi,* with the indicative 19 times and only in direct discourse.

Tametsi with the indicative, V, 34, 2; VII, 43, 4; VII, 50, 2; With the subjunctive in *oratio obliqua,* I, 30, 2.

Cum, with the coloring of concession, 18 times.

Ut, III, 9, 6.

6. *Comparative Conjunctions.*

227. I, 32, 4, "velutsi coram adesset"; VII, 38, 7, "quasi vero consilii sit res."

THE IMPERATIVE

228. The future imperative is not found in Cæsar. The present imperative in a direct command occurs IV, 25, 3; VII, 20, 8; VII, 38, 3; VII, 50, 4; VII, 50, 6; VII, 77, 16.

The circumlocution with *noli* occurs in VII, 77, 9.

THE INFINITIVE

229. The uses of the infinitive in Cæsar are numerous and agree in all respects with the rules of the ordinary school grammar. The different uses are:

(a) As the subject of impersonal verbs, etc. See, *e. g.,* VII, 42, 4; VII, 29, 3.

(b) In indirect discourse.

(c) The complementary infinitive.

(d) The historical infinitive. This occurs but 6 times in Cæsar: I, 16, 1; I, 16, 4; I, 32, 3; II, 30, 3; III, 4, 1; V, 33, 1.

If pupils are thoroughly drilled in the two uses of the infinitive especially — that of the infinitive in indirect discourse and the complementary infinitive — very little difficulty will be experienced in interpreting these forms.

The Nominative with the Infinitive

230. With the passive verbs:

(a) *Dicor,* 9 times; *existimor,* 8 times; *audior,* VII, 59, 1.

(b) *Videor,* 43 times; *videri,* 12 times.

(c) *Iubeor,* III, 21, 3; V, 37, 1; VII, 35, 5.

(d) *Coeptus sum,* I, 47, 1; II, 6, 2; IV, 18, 1; IV, 18, 4.

THE SUPINE

231. (a) The supine in *-tum.*

After *mitto,* 1, 11, 2; IV, 32, 1; V, 36, 1; VI, 32, 1; VI, 36, 2; VII, 5, 2.

Colloco, I, 18, 7; *convenio,* 1, 30, 1; *venio,* I, 31, 9; I, 37, 2; V, 26, 2; VII, 12, 3; VII, 18, 1; VII, 32, 2.

The supine takes an object in I, 11, 2; I, 31, 9; VII, 5, 2.

A final clause depends upon the supine in V, 36, 1; VI, 32, 1; VII, 32, 3.

A causal clause depends upon the supine in I, 37, 2 and I, 18, 7.

(b) The supine in *-tu* is found in I, 3, 6; VII, 64, 2; IV, 30, 2; V, 14, 2.

Summary

A Synopsis of Examples for the Chief Rules of Syntax in the Bellum Gallicum

The Tenses

232. An imperfect or pluperfect subjunctive follows a historical tense 630 times; a present or perfect subjunctive follows principal tenses 210 times; the regular sequence of tenses in result clauses 128 times; in *oratio obliqua* the subjunctive of principal tenses follows historical tenses 36 times; *cum* in narration follows the historical present with the imperfect or pluperfect subjunctive 32 times; after a historical tense the following clause has a principal tense 11 times; a subjunctive present or perfect depending on a perfect outside of *oratio obliqua* 5 times.

The Moods

233. The indicative in expressions denoting necessity, 3 times; the hortatory and imperative subjunctive in principal clauses, 3 times.

234. *Temporal Conjunctions.*

Cum has the subjunctive 245 times; *postquam* (12), *ubi* (36), *ubi primum* (2), *simul, simulatque* (3), *cum* = "as soon as" (6), *cum primum* with the indicative perfect, 60 times; constructions of *dum* (26), *quoad* (4); construction of *priusquam*, 30 times; *cum* temporal with the indicative, 27; *quam diu*, 1; *donec*, 0.

235. *Final and Consecutive Conjunctions.*

Ut after verbs meaning to *wish, desire, advise, request*, etc., 94 times; *ut* consecutive after all expressions containing a "so," 80 times; *ut* final, *in order that*, 54 times; *ne, in order that . . . not*, 44 times; *ut, so that*, without a preceding *ita*, 39 times; *ne*, after verbs of *requesting, commanding*, etc., 33 times; the bare subjunctive without *ut* after verbs of *wishing, commanding, requesting*, etc., 28 times; *ne quis*, 28 times; *ut* after *est, futurum est, fit accidit*, 22 times; *quin* after negative expressions, *doubt, hindering*, etc., 20 times; constructions of *persuadere*, 18 times; construction of verbs of *fearing* (*ne* and *ut*), 16 times; *quo* with a comparative, 14 times; *ut* final after verbs of *striving, caring for*, etc., 11 times; *ne* after *caveo, contineo, detereo*, 10 times; *ut* after

verba sentiendi et declarandi, 9 times; *ut* epexegetical, 8 times; *ne* after verbs of *caring for* and *striving after,* 7 times; *ut* after *concedo* and *permitto,* etc., 6 times; *ne* after *verba declarandi,* 6 times; *ne . . . aut . . . aut,* 5 times; *quominus* after *recuso, terreo,* 3 times; *ne . . . et (ac),* 3 times; *accedit ut,* 2 times; *placet ut,* 2 times; *jus est ut,* once; *relinquitur ut,* once; *ne . . . atque ut,* once; *ne . . . ut,* once; *ne . . . nec, nec . . . nec,* once; *ne quis,* once; *ne quisquam,* once; *necubi,* once; *quod, quoniam,* once.

236. *Causal and Object Sentences.*

Quod, because, with the indicative, 136 times; *quod, because,* with the subjunctive, 44 times; *quod, the fact that,* 30 times; *quoniam,* 16 times; *quod* with *queror, indignor, reprehendo, accuso, gratias habeo,* 13 times; *quod, whereas,* 9 times; *quare,* with the subjunctive, 6 times; *quod* with the subjunctive by attraction, 4 times; *accedit quod,* 3 times; *siquidem,* once.

237. *Conditional Sentences.*

Unreal conditions referring to the past with the historical tenses of the subjunctive (mainly in *oratio obliqua*), 60 times; the subjunctive used for the future in conditional sentences, 45 times; *si* in oratio obliqua with the present subjunctive or perfect, 32 times; *si qui, si quis, si qua, si quid,* 20 times; *si* with the indicative, 13 times; *si . . . si,* 12 times; *nisi,* 12 times; *si non,* 11 times; *quod si,* 10 times; *si* with the subjunctive, *whether,* 10 times; *si modo,* 2 times; *si non . . . at,* 2 times; *si minus,* 2 times; *quod nisi,* once; *si . . . sin,* once; *sin autem,* once.

238. *Concessive Conjunctions.*

Etsi with the indicative, 19 times; *cum* adversative, 18 times; *tametsi,* 4 times; *ut,* once; *quamvis, licet, quamquam, etiamsi,* no time.

239. *Comparative Conjunctions.*

Velutsi, once; *quasi,* once.

240. *The Subjunctive Dependent on a Relative.*

Relative sentence in the *oratio obliqua* in the subjunctive, 160 times; *qui* with the subjunctive, especially after *venio, mitto, relinquo,* 47 times; relative sentence in the subjunctive by attractions, 29 times; after *habeo, reperiuntur, nihil est, neque, quisquam est,* 7 times; after *idoneus,* once.

241. *Interrogative Sentences.*

Subjunctive of indirect question, 120; direct questions in the subjunctive in *oratio obliqua,* 11 times; double questions, 6 times;

an with a direct questions, 3 times; *-ne* enclitic, 2 times; rhetorical questions in *oratio obliqua* and accusative with the infinitive, 2 times; *necne* in indirect double questions, once; *ne...an...an,* once; *quid ergo,* introducing another question, once; *num,* expecting a negative answer, I, 43, 3, once; *nonne,* no time; *nescio an, dubito an,* no time.

242. *The Imperative, Infinitive, and Accusative with the Infinitive.*

The accusative with the infinitive after verbs of *saying* and *thinking,* 500 times; *sui, sibi, se* and *suus* in dependent or subordinate clauses, 200 times; nominative with the infinite with passive verbs, 133 times; *volo, nolo, malo, cupio, studeo, statuo, decerno, patior* and *sino* with the accusative and infinitive, 124 times; *iubeo* and *veto* (3) govern the accusative with the infinitive, 103 times; relative sentences in the accusative with the infinitive (*vir, quem divitem esse scio*), 62 times; the accusative with the infinitive as subject of—

(a) *Est* with the neuter of an adjective or with a substantive.

(b) With *oportet, opus est, necesse est, interest, placet, constat,* 50 times.

Subordinate clauses of *oratio obliqua* in the indicative, 42 times; the bare infinitive as subject of impersonal verbs, 33 times; *cogere* with the infinitive, 20 times; constructions of *persuadere,* 18 times; the accusative with the future infinitive after verbs of *hoping, promising,* etc., 18 times; historical infinitive, 6 times; the accusative with the infinitive after passive verbs used impersonally, 17 times; *prohibeo* with the infinitive and with the accusative with the infinitive, 14 times; the accusative with the infinitive of the gerund after *statuo, constituo, censeo,* 12 times; the accusative with the infinitive, epexegetical, 12 times; direct questions in the subjunctive in *oratio obliqua,* 11 times; *videtur* impersonal with the bare infinitive, 6 times; *paro* and *paratus sum* with the bare infinitive, 6 times; *impero* with the accusative and infinitive, of passive verbs (2), active verbs (1), 3 times; the accusative of the present participle with *conspicio,* 3 times; *nitor* with the bare infinitive, 2 times; *non dubito* with the bare infinitive, 2 times; *vereor* with the infinitive, 2 times; *consilium capere* with the infinitive, 2; *polliceor* with the bare infinitive, 2 times; rhetorical questions in the accusative with the infinitive,

2 times; prohibition expressed by *noli* with the infinitive, once; *licere illis...discedere,* once; *quibus licet esse fortunatissimos,* once; *desidero* with the accusative with the infinitive, once; *praeopto* with the bare infinitive, once; *gravor* with the bare infinitive, once; *intermitto obsides dare,* once; *neglego hoc facere,* once; *intendo fuga salutem petere,* once; *cogito* with bare infinitive, once; *in animo habeo* with bare infinitive, one; *recuso* with bare infinitive, once; *spero* with the bare infinitive, once.

243. *Gerund and Gerundive.*

The accusative of the gerund after the preposition *ad,* 86 times; the genitive of the gerund after substantives, 77 times; the genitive of the gerund with *causa* and *gratia,* 53 times; the dative of the person instead of *ab* with the ablative with the future passive participle, 26 times; the ablative of the gerund after the prepositions *in* and *de,* 21 times; the gerundive as a predicate accusative or nominative with *curo, do, trado,* 17 times; the genitive singular of the gerundive with the genitive plural *sui,* 10 times; *ad* with the gerund with *impedire* and *tardare,* 5 times; the ablative of the gerund as instrumental, 4 times; the genitive of the gerund after *cupidus insuetus,* 2 times; dative of the gerund after *diem dicere, tempus dare,* 2 times; the dative of the gerund after adjectives, 0; the accusative of the gerund with *in, inter, ob,* 0; the ablative of the gerund after *ab, ex, pro,* 0.

244. *The Supine.*

The supine in *-tum* after verbs of motion, 14 times; the supine in *-tu* after adjectives, 4 times; the supine in *-tum* has an object 3 times.

245. *Participles.*

The ablative absolute, 770 times; *habere aliquid sanctum, perspectum* and *confectum, redemptum, compertum, exploratum,* etc., 8 times; *partitus, expertus, dimensus* in the passive signification, 6 times.

IV

THE LITERARY INTERPRETATION OF CÆSAR

By GONZALEZ LODGE

In Chapter III of his work on the Teaching of Latin, Professor Bennett sums up the objections to the use of Cæsar as a reading book in the secondary school under the following heads: first, Cæsar is undeniably difficult; second, Cæsar is not interesting; third, the bearing of Cæsar's narrative is not obvious.

With regard to the first objection I have nothing to urge. There seems to be a divergence of opinion, as is to be expected among teachers, as to whether Cæsar is very difficult or not. I imagine that the difficulty will vary to a certain extent according to the qualifications of the students and the efficiency of the teacher, but in the main it will be admitted that the passages in indirect discourse are not simple.

Moreover, I do not see how a pupil could be expected to find the point in Cæsar's narrative if it is not explained to him, but this is true of almost all historical works and must, of course, be preëminently true when the rate of progress is as slow as is usually the case in beginning Cæsar. Fortunately, the pupil in most cases is not anxious to see the remote point. He is satisfied with fixing his attention upon what is immediately in front of him, and if that is comprehensible and evident he cares little for the rest. Now it may be just as emphatically stated that the management and the bearing of Cæsar's military operations can be immediately understood. In every case he is looking to an immediate object and taking his measures accordingly. Almost all the episodes are short and can be included within the compass of ten to fifteen pages; and in these episodes, be it the Helvetian War, the war against Ambiorix, the invasion

of Britain, the invasion of Germany, the war against Vercingetorix or whatever it be, the measures taken, the actions described have an immediate bearing which cannot fail to be observed by any keen pupil and be made sufficiently evident to any dull one by the proper teacher. Consequently, the third objection of Mr. Bennett, like the first objection, does not seem to me to be of particular importance.

The second objection, Cæsar is not interesting, is a more serious one. Professor Bennett states: "The writer does not impress us as gifted with imagination, historic or other. He is exceedingly dry. There is little to excite the enthusiasm. The narrative, moreover, is monotonous. We have practically an unbroken chronicle of marches and victories, in which the triumph of trained Romans over undisciplined and poorly equipped Gauls and Germans is nothing surprising. Patches of interest appear here and there, to be sure, as where Cæsar gives us descriptions of the customs of the Gauls, Britons, or Germans. These are brief, however, hardly more than oases in the surrounding desert of military details." Further on in his article, he maintains that nothing could be more grotesque to the minds of most than to attribute a literary character or quality to Cæsar. "He simply gives us a plain and colorless statement of facts, with hardly any nearer approach to literary charm than does a clear statement of a proposition in geometry." This attack upon the literary character or quality of Cæsar will, in despite of Mr. Bennett's statements, strike most discerning critics as remarkable. It is not important, perhaps, nor is it necessary to enter into a defence of the literary character of Cæsar's *Commentaries,* when a man of as keen literary feeling as Mackail can say that "the combination of literary power of the very first order with unparalleled military and political genius is perhaps unique in history."

Mr. Bennett himself states further on that in despite of all these charges against Cæsar most teachers cling tenaciously to him, and that many pupils find Cæsar interesting, not merely more interesting than Nepos, but possessed of a positive human interest *per se.* This statement, which reflects credit upon Mr. Bennett's candor, ought to have made him very doubtful about his previous position, and ought at the same time to have given him a clue which he has apparently failed to grasp as to why Cæsar is interesting. What he finds interesting in Cæsar are the

descriptions of the customs of the Gauls, Britains and Germans. I have no hesitation in saying that to the majority of pupils and to most grown pupils, who are not ethnologists, these very descriptions which Mr. Bennett finds interesting are the most stupid parts of Cæsar. A boy might perhaps be interested in learning whether the Britons were blue-eyed and long-haired and ruddy complexioned or not, but he will not be interested particularly as to whether they lived on milk or beef, nor will he be interested in various other details as to their methods of life. An ordinary boy finds, as is admitted, particular charm and interest in accounts of achievement, in accounts of activity; the more things are done by the actors in the drama the more interested is the boy, and if there is a lot of swashbuckling sword-play the enthusiasm of the spectator will rise beyond bounds. Now this is just exactly what Cæsar gives. It may be a matter of misfortune that he sandwiches a great deal of this in between speeches in indirect discourse, and descriptions of the customs of the Gauls, Britons and Germans, but still there is enough for all practical needs.

The Pictorial Element in the "Bellum Gallicum"

But what I wish to draw special attention to in this chapter is this picturesque element in Cæsar's descriptions, which while not obvious is at the same time easily brought out by the discerning teacher. Cæsar abounds in pictures. By reason of the exigencies of his style, by reason of his crisp and concise statements, his habit (as Mr. Trollope has stated) of combining so many things in one sentence that it needs two or three English sentences to render it adequately, it becomes incumbent upon the teacher to see that all the elements of his narrative are brought out. As a sample of what I mean in very brief form, in the 4th chapter of the first book, after the intrigues of Orgetorix are announced to the Helvetians, Cæsar says: in accordance with their customs they compelled Orgetorix to plead his cause in chains, and if condemned the punishment must needs follow that he should be burned with fire. On the appointed day Orgetorix gathered together from all sides to his trial all his family connection to the number of ten thousand people, all his clients and debtors, of whom he had a large number, he brought together

to the same place, and by their means he saved himself from pleading his cause. Now in that brief description, we have a number of elements of picturesque description. The most important thing, from the point of view of the pupil, in order to bring this out to life, is the simple expression "in chains." If the teacher is keen, he will ask his pupils for a picture, either actual or in words, of Orgetorix before the tribunal. It is a good situation for an illustration; an illustrated edition of Cæsar would probably have a picture here. And before the tribunal would be standing in solitary state Orgetorix with chains upon his hands and feet. Why should not that be impressed upon the pupil, even if he has not seen it before? The fact that he was to be burned to death afterwards adds interest to the scene. And when we get the assembly of all his tribe and all his friends and all his debtors to the same place, we can very readily understand how he rescued himself. Now it seems to me that a first paragraph like this shows every one of the things that Mr. Bennett denies Cæsar the possession of. It seems to me that there is imagination here, pictorial imagination; it seems to me that there is nothing dry in this; it seems to me that there is nothing monotonous in this — nothing to arouse enthusiasm, perhaps, but there are plenty of other places where enthusiasm can be aroused.

For a larger case it may be worth while to cite a passage in the 44th chapter of the fifth book. It is the celebrated rivalry between Pulio and Vorenus. This chapter has a brief dialogue in direct discourse, in which the one challenges the other, and it is simply charged with action from beginning to end. It is a long chapter, twice as long as usual, and in it the action is hurried on so rapidly that the reader has almost no time to take breath. Cæsar wakes up to the situation, and expresses the whole scene in the pictorial, historical presents. Let me quote: "Pulio, as he was fighting vigorously at the fortifications, said: 'Why hesitate, Vorenus? What place are you looking for equal to your praise of your valor? This is the day that will give judgment upon our controversy.' And when he had said this he went without the fortifications and where the mass of the enemy seemed to be the densest he makes his attack. Nor does Vorenus stay within the rampart, but out of fear for his reputation he follows along; and when he is close to the enemy's line, Pulio throws

his javelin upon the foe and transfixes one of them who was rushing forth from the multitude. Him thus stricken and lifeless, the others protect with their shields, and all of them throw their javelins against his enemy and do not give him a chance to retire. Pulio's shield is pierced, a dart is fixed in his belt. This mischance pushes his sword sheath aside, and when he tries to draw his sword it stops his right hand, and, thus impeded, the enemy surrounds him. Vorenus, his foe, rushes to his assistance and helps him in his extremity. So immediately against him and away from Pulio, the whole multitude turns, for they think that Pulio is killed by the dart. Vorenus carries on the matter hand to hand with his sword; he slays one, he pushes the rest back a little space; but while he pushes eagerly on he slips and falls into a low spot of ground. Now while he is surrounded Pulio comes to his assistance in turn, and so both are saved, and having slain many of the enemy, come with the greatest glory back into the fortifications. Thus fortune treated each of them variously in their strife and rivalry, so that each one, though the enemy to the other, became on the same day the help and the salvation of the other, and it could not be decided at all which was to be preferred for bravery."

Now in this description we have all that the most exacting critic could require — the power of vivid imagination and rapid description. It may be a matter of regret that Cæsar has not applied more frequently the capacity that he displays here; but this passage shows that he certainly had it in a great degree.

I add a few of the many passages in the *Bellum Gallicum*, where imagery and vigor are evident — sometimes limited to a phrase or two, sometimes more extensively displayed. I designedly limit myself mainly to the first book.

In the twentieth chapter of the first book, Diviciacus with many tears embraced Cæsar and began to implore him not to take severe measures against his brother. The life of the scene is to be found in the attitude and tears of Diviciacus.

In the thirty-second chapter of the same book when the Gauls were in tears before Cæsar asking assistance against Ariovistus, the Sequani did none of the things that the rest were doing, but sadly and with downcast heads stood gazing upon the ground. The vigorous part of this scene lies in the attitude of the Sequani, which is offset by the weeping of the rest of the Gauls.

In the thirty-ninth chapter is the famous description of the condition in Cæsar's camp before the battle with the Germans. The troops were unable to control their countenances or restrain their tears. Every one was making his will. They hid in their tents and bewailed their fate — or bemoaned the common peril. This scene is one of the most remarkable in Cæsar, and must be thrilling when interpreted by a good teacher.

In the forty-third chapter occurs the meeting between Ariovistus and Cæsar. What Cæsar tells us is meagre enough, but sufficient to give some impression of the locality and the arrangement of the two parties. In the Gotha pictures this scene is presented most inspiringly, with the aid of what the study of antiquities tells us of the appearance, costumes and bearing of the Romans and Germans.

In the forty-sixth chapter the breaking up of the conference is related in brief but sufficient terms and the effect on the Roman troops is also made plain.

In the forty-eighth chapter there is a description of the method of fighting among the Germans which is terse, vigorous and clear, and can be made very interesting to an imaginative class.

In the fifty-third chapter we find a picture of the situation of C. Valerius Procillus, when he was rescued from the Germans, where the vigor of the scene is in the position of the ambassador.

In the second book there are a couple out of many passages to which I desire to draw attention. In the twentieth chapter Cæsar tells us what measures he had to take in very short space of time to meet the crisis in the battle with the Remi. The passage is very excited — the copulas are omitted, the whole is a mass of asyndetic clauses of two or three words each. Nothing could be more vigorous, nothing more rapid, nothing more indicative of Cæsar's genius as a commander.

In the twenty-fifth chapter is the well-known long sentence of over ninety words. It shows what Cæsar's practised eye took in at one glance as he came up to the hard pressed right wing in this same battle; between the subject and the verb *vidit* are found six verbs in the ablative absolute, asyndetically combined, and six other verbs in the infinitive, with contrasted conjunctions. The passage cannot be paralleled in Latin for the total effect of instantaneous view over a large area of the

struggling elements in a battlefield. Too much stress cannot be laid upon the proper interpretation of this passage, and the student who understands fully, and sees completely all the elements in this scene, has learned a lesson in the possibilities of literary expression in Latin which will be of immense value for all subsequent study.

Just one more case, and I leave this part of my subject. In the fifth book, chapters six and seven, to which I shall recur in another connection, are as fine cases of literary genius as the historical style of literature can show. All the resources of rhetoric, and oratorical power are employed — and all the devices which Latin style allows are fully exemplified in these chapters. They will repay the most detailed study.

The Characters in the "Bellum Gallicum"

The *Bellum Gallicum* was preëminently a war between opposing nationalities or types of civilization. Individual leaders were a matter of much less importance than the movements of tribes which they either guided or inspired; hence we look in vain for characteristics of generals or captains engaged, for any analysis of character such as is so frequent in Xenophon, and is made by him a special object in the last chapter of the first book of the *Anabasis*. Names, to be sure, there are in plenty, but they are little more than names, and for all practical purposes we are in a cloudland where no individual stands out distinct, apart from the movements with which he is identified. In this peculiarity Caesar is not alone. It is characteristic, more or less, of all ancient historiography, and in a small degree of modern, due no doubt to the radically sound principle that the leader in any event is but the crest to the wave which has its movement far deeper, and took this crest by accident. Nor is this peculiarity confined to the leaders of his opponents only. Cæsar gives us no pen pictures of his own captains, and, of course, leaves himself out of consideration completely, so that if we would form some idea of the personages who figure in the narrative, we must have regard to their actions and interpret their natures from them. By reason, however, of Cæsar's evident desire to give the fullest basis for judgment of all his actions, we are enabled to have a keener understanding of the parts taken by

these various men in the great movements of the war, and, with care and attention, it is possible to reconstruct in bold lines the principal figures. I shall, as examples of this, confine myself to the three principal characters in the first book, assuming, of course, that what is done for the first book can be done for those that meet us in the others.

In the first book the first name that meets us is that of Orgetorix, the Helvetian. His activity is confined to Chapters II-IV, and brief is his life upon the page of Cæsar's *Commentaries.* Rich he was and noble, in fact the richest and the noblest in his country; a man proud and ambitious also, who saw in his own land no chance for his own advancement except to seize the kingship and in a people nominally free to hold easy supremacy over all his peers. He was cunning and crafty to persuade, so he called together the chief men of his tribe, held out to them a glittering prospect of rule over the whole of Gaul, a sovereign people of a subject race, of which people, while they themselves should be the rulers, he would be the over-lord. It was a brilliant scheme, none the less brilliant because doomed to failure, and in reality not so impracticable if another than Cæsar had been in his way.

This ambitious man lost no time in carrying out his plans. That he aimed at a tyranny must have been carefully hidden from the Helvetian nobles, but that the Helvetians would become the ruling class was the bait held out and greedily swallowed, and how far the poison permeated is evident from the fact that even when the prime mover of the scheme was removed, the people persevered none the less in the plan he had laid out for them. In the furtherance of this scheme, which his keen judgment taught him was beyond his unaided powers, he sought a kindred spirit beyond the borders. To do this unobstrusively he became an ambassador of his people to the neighboring tribes of Gaul, to gain their friendship and peace. In the course of this embassy he discovered the man he was looking for in the person of Dumnorix, the Æduan, brother of Diviciacus, to whom he was so much drawn that he bound him to himself by marriage ties, as well as by the bonds of policy. To him he added Casticus, the Sequanian, whom he induced to seize the kingdom of the Sequanians; but while he admitted him to the scheme, he did not feel it necessary to bind him to himself by

any tie of intimacy, and the justice of his view is evident when we observe that with the overthrow of Orgetorix Casticus disappears also from the scene, while Dumnorix, the bolder man, remains in his original power. The bait that Orgetorix held out to these two is clearly and succinctly given by Cæsar in the short indirect speech that he puts into Orgetorix's mouth, *Perfacile . . . confirmat.*

How the knowledge of these dark schemes was divulged to the Helvetians we do not know; Cæsar says merely *per indicium.* Perhaps Casticus turned traitor; perhaps a trusted intermediary was bribed; but in any case, it was soon known that Orgetorix intended not merely that the Helvetians should be a sovereign people, but that he should be the sovereign of them. Treason to the State, always a grievous charge, was certainly a very grievous one among the Helvetians. The accused must stand before the tribunal with manacles upon his hands and feet, chained as a criminal — he who had before now been the greatest of his people, the noblest and the richest still, but shorn of his power, his influence and his character. If condemned, he would be burned alive. Was there ever such a contrast, such an overturning of hopes and of carefully laid plans? We are therefore not surprised that he should strain every nerve to escape condemnation. All his kindred — 10,000 in number — all his clients, all his debtors — and, as the richest man he must have had a swarm of them — were on hand. He was rescued, but at what cost, and with what result! He saw his glittering future destroyed, his reputation gone, and his exasperated countrymen gathering together to destroy him. To resist meant civil war, with only one end; but it did not come to that, for in the midst of the preparations he died, and Cæsar closes his story with the significant words, *Neque abest . . . consciverit.* Suicide was his only honorable way out, and the fact that Cæsar gave currency to the rumor reveals to us that in Orgetorix he recognized a master spirit whose designs were as great as his own, and whose end was the end that he himself would choose if fate should be unpropitious, just as Brutus did later on.

It is apparent then that here, in the very beginning of the book, we have an episode of surpassing interest told in the dry clear way of the broad observer of human nature, with not a single important detail omitted from the early aspirations with

their foundations in his rank and wealth to the tragic end of a man whom fate and not weakness had conquered.

But this story has a wider significance. Why was not Cæsar content to begin his narrative with Chapter V rather than with Chapter II? So far as the Romans were concerned the movement began with Chapter V. I think the reason is easy to discern. It was not merely because in the career of Orgetorix he took a great interest and so far as he could he intended to hand down to posterity the name of a great man who was his opponent, though some such idea may have been in his mind; nor did he know that the migration of the Helvetians was part of an ethnological movement, and hence had a world meaning — he did not know as much as we do about those things; but he doubtless wanted to show that the Helvetians were a lordly people, that they came forth to conquer and to rule, that no matter what they might say, their errand was not a peaceful one, and that in the conflict with them the Romans were fighting their old battle with the Gauls. The struggle for existence was on again. That a kindred spirit was the immediate cause of the movement added interest to Cæsar only, and I have no doubt that had Orgetorix lived and thrived, we should have had a meeting between him and Cæsar, and the representatives of two civilizations would have been brought out face to face between the two armies. But this was not to come until Ariovistus appears.

To the casual reader, perhaps, all that I have tried to bring out in these three chapters may not be evident, but when we consider the extreme compression of Cæsar's style, and the tendency to conciseness and brevity which characterizes the whole narrative, we cannot, it seems to me, interpret this introductory episode otherwise.

Would I so interpret it to a class beginning Cæsar? That is a question not so easy to answer, but I would say emphatically, that the teacher of Cæsar should feel in this episode all that I have indicated, should have appreciation of Orgetorix's design, knowledge of his aspirations, sympathy for his downfall, and recognition of his greatness, with the further understanding of the place of the episode in the whole story and, consequently, a proper estimate of the literary element in Cæsar that caused its insertion. If he has this in his mind, the teacher will be more

interested in the narrative, and will therefore be more interesting to his class. This much, however, may be suggested. Questions for discussion as to Orgetorix's motives, his methods, his aims, his suicide might all be made occasions for slight intimations to an observing class as to what the Helvetian War meant in the history of Rome and, therefore, in the history of nations.

Dumnorix, the Æduan, is the next character who fixes our attention. He had been chosen, as we have seen, by Orgetorix as a kindred spirit to further his plans.

By our study of this man we are introduced not merely into the political affairs of the Æduans, but also into a family feud arising from political differences. Dumnorix and Diviciacus were brothers, of a family of great influence and importance among the Æduans, that tribe on which above all others Cæsar relied for assistance in his work in Gaul. Diviciacus was one of the chief magistrates of his people, and seems to have been a man of wisdom and foresight. Some time before he had visited Rome to ask the assistance of the Romans against the Sequani, who had brought in the Germans to support themselves. It was probably on this trip to Rome that Diviciacus first became convinced of the greatness of the Romans and the advantage to be gained from an alliance with them. The assistance he craved, though refused at this time, was granted when Cæsar appeared in Gaul.

What had been originally a matter of immediate necessity to Diviciacus became later a matter of settled policy, for it seemed that the safety and consequence of the Æduans depended upon their close association with the Romans. Probably Diviciacus was right in believing that the supremacy of the Romans was inevitable, and that his best policy was to make as good terms with the conquerors as possible. Perhaps also he actually believed that the civilization, which was bound to come in the Roman train, would ultimately bring upon the Gauls more blessings than they could now foresee. On the other hand, this position was not one that appealed to the people, a proud, volatile, but patriotic people, who felt that slavery to any one was a calamity, but that slavery to a foreigner was worse than a calamity, — it was an infamy. At the head of this party, which may be called loosely the patriotic party, was Dumnorix, who although a private individual, had more actual power in the State than the magistrates themselves.

How Dumnorix obtained this power is told by the other magistrate, Liscus, in Chapter XVIII, where at the same time we have a most interesting account of how any man might obtain influence in a state organized as was the state of the Æduans. To great family distinction Dumnorix added great boldness of mind, *summa audacia*, says Cæsar, combined with a careless generosity which is always very attractive to the unthinking multitude. Accordingly, even at the time that Orgetorix sought him, he had become *maxime plebi acceptus*. Hence when he entered the public competition to bid for the right to collect the taxes of his government, no one had been found willing to bid against him, and he had gotten the office at his own price. The wealth gained by this was spent lavishly; he kept about him a large band of horsemen; cultivated relations of friendliness with important people at home and abroad; went so far as to give his own mother in marriage to an influential Viturigan noble; took a wife for himself from the Helvetians, Orgetorix's daughter, as we know, and bestowed his sister and the rest of his kindred upon men of importance in this state and that. He was verily a kindred spirit to Orgetorix, and one who to his self-seeking aggrandizement added a hatred of the Romans, the greater because not only did the Romans threaten his country, but his own private power as well.

Cæsar was quick to recognize in this restless man an opponent of no small importance, and his suspicions were quickly confirmed by the events of Chapter XVI. Not open antagonism, was the plan of Dumnorix, but secret and underhand intrigue. The public assistance which the Æduans owed Cæsar by virtue of their agreement with him was withheld by private dillydallying and excuses; and at the most critical period, with an enemy in Cæsar's front, or even in the very course of the battle, the defection on the side of the Æduans was sure to become manifest. For at Dumnorix's orders, the Æduan Commons were very slow in bringing in the grain supplies, and when the battle was raging the Æduan cavalry, which Dumnorix commanded, set the signal for retreat.

Why did not Cæsar take summary vengeance upon Dumnorix? The reason that he himself gives us in Chapter XIX is this. He was afraid to offend the brother of Diviciacus. The word he uses in this connection, *verebatur*, rather indicates hes-

itation due to high esteem and respect for Diviciacus, and his good will towards the Romans and towards himself. But of course motives of policy were added to this personal esteem. The Æduan people were on the side of Dumnorix. The Æduan government was on the side of Diviciacus; so to alienate Diviciacus would be to make the state hostile, not only privately but publicly, and even if Diviciacus were not alienated, the disaffection of a popular idol, who was at the time the brother of the chief magistrate, would certainly increase popular disaffection and weaken the brother's power.

This fourth section of Chapter XX contains one of the most profound statements of statecraft and throws great light upon the political sagacity of Diviciacus and Cæsar together. As a result of a conference, Cæsar called Dumnorix to him, and in the presence of his brother set forth the situation, urging him to mend his ways for the future, and explaining that he overlooked the present for his brother's sake, though he put him under special surveillance so as to be fully apprised of all his actions.

Probably this was the best thing that Cæsar could do. At the same time, he must have known that it was only a temporary expedient. The very indignity put upon Dumnorix would inflame his spirit still further and make him more determined than ever in his opposition to Cæsar's plans. On the other hand, Cæsar must have foreseen that with constant supervision Dumnorix could do nothing that would seriously disturb him, or take any measures which foreknowledge would not give him an opportunity to check. Still the exasperation of continually baffled plans, and the appreciation of personal impotence, might easily lead him to some overt act which Cæsar might use for summary punishment at a time when neither criticism nor suspicion could attach to Diviciacus.

Cæsar's measures seem to have been successful for a time. At least we hear nothing more of Dumnorix for a considerable interval. That he retained his command of the Æduan cavalry seems likely, for when we next meet him he still occupied this position. That he pursued the same tactics as before is also not unlikely, for in our final meeting he is still acting after the same fashion. That, however, due either to lack of opportunity or to Cæsar's careful watching, he had been unable to effect anything

is certain by reason of the obscurity into which he falls during the next three years.

At the beginning of the next book occurs an opportunity where Dumnorix thought he finally had his chance, and where Cæsar certainly found his. Cæsar was preparing for his second expedition into Britain. Expecting to be gone some time, he was endeavoring to leave matters behind him in as settled a condition as possible. Unruly spirits he proposed to keep near him and to take over to Britain in his train. The one whom, above all others, he had in his mind was Dumnorix, and he devotes two whole chapters to him — Book V, Chapters VI and VII. He again explains his character, shows how restless his disposition was, how lofty his spirit, how ambitious his designs, how widespread his influence, and then he proceeds to detail the controversy which resulted in his death.

I have already (p. 126) indicated how stylistically important these two chapters are, so that I need not go into that question here; but I will add that no greater tribute to the power and formidableness of this bold spirit could be made by Cæsar than the insertion of this episode at this particular place.

Book V in fact begins practically a second broad division of the *Bellum Gallicum*. The second expedition to Britain was to conquer a new country. Gaul was now considered, though wrongly as it turned out, to be practically subdued; but Cæsar, like Alexander, having once got the taste of conquest thirsted for additional worlds: so here, as in the first book, he stops before plunging *in medias res*, and to a certain extent plays with the subject. In truth the death of Dumnorix was not an integral part of the Britannic expedition. Its omission would not have affected the narrative in the slightest degree, but it was the final disappearance from the scene of one with whom Cæsar had had great trouble. It was a distinct stepping-stone in the march of conquest. It was at the same time the vindication of the policy which Cæsar had inaugurated three years before. It was the final defeat of a strong man by a stronger, and in every way an important episode for the study of Cæsar's policy and statecraft in general.

Furthermore, from the point of view of literary function, the episode welds together two sections of the narrative, the first four books with the last three, by its direct relation to

Book I, Chapter III. Dumnorix makes his first appearance at the beginnings of Cæsar's operations in Gaul, his last appearance when the task of conquest was, in Cæsar's mind, nearly completed and a new field for operations was to be sought.

As for Diviciacus, little need be said. His importance for Cæsar was undoubtedly great, but we are interested in him more as the foil of his brother. He follows Cæsar's fortunes with unswerving loyalty throughout. In Book II he assists in the campaign in many places: Chapters V, X, XIV, XV. His voice is always raised for mercy, and his work is always ready. His tried honor and loyalty made him the most useful man for the reorganization of Gaul, and he was, of course, left behind when Cæsar went to Britain. He appears in Book VI, Chapter XII, in a general view of the state of Gaul at Cæsar's arrival. In the seventh book, where the last mention of him is made, he seems to be already some time dead, but how he passed away, whether by natural death or not, Cæsar does not inform us. He had used him so long as was necessary, and to his memory he gives not a single line either of regret or appreciation.

In the first book one more character remains for discussion, namely, Ariovistus. There is not the same cause for a careful study of him as there was in the case of Dumnorix, but still we may make not a little out of Cæsar's references.

The speech of Diviciacus in Chapter XXXI explains how he came to be in Gaul, and also gives some indications of his activity and habits. Ariovistus was *barbarus iracundus temerarius:* a typical German chieftain, cruel and grasping, with none of the graces of civilization. His watchword seems to have been, "given an inch, grasp an ell." He was haughty and overbearing; he governed by fear rather than by persuasion; he regarded hostages only as persons upon whom to vent his outrageous cruelty. He had no regard for the uses of international law, as it was then understood, and even the sacred person of an envoy was not safe in his hands. But, most important of all, it was evident that he aspired to a control over the whole of Gaul, with the Gauls as subject peoples, and it was in this connection that he came into Cæsar's way. The complaints of the Gallic chieftains, as voiced by Diviciacus, lead to an interchange of communications between Cæsar and Ariovistus, then a meeting, and finally a battle, in which Ariovistus is destroyed and the Gallic frontier made safe until the time of Germanicus.

The reasons why Cæsar decided to use force with Ariovistus and drive him back across the Rhine are admirably, if briefly, set forth in Chapter XXXIII. It was, in a word, the following out of the traditional policy of the Roman State. Prestige was menaced if the Æduans were not protected. Danger was incurred if the Germans were allowed to gain a foothold in Gaul, and, finally, disgrace was imminent if a man like Ariovistus were allowed to lord it in a land where Diviciacus had the protection of the Roman people. The negotiations before the battle are very interesting from the light they throw upon the individuals concerned. The studied moderation of Cæsar, the blustering insolence of Ariovistus; the courteous firmness of the statesman, the blind anger of the arrogant freebooter; the cold consciousness of power on the one side, the vanity of limited outlook on the other. Still Ariovistus was not without shrewdness, as he evidences by his appreciation of the fact that both himself and Cæsar were in Gaul for practically the same purpose, that in reality Cæsar's position, while specious, was false, and that under the guise of helping the Æduans his real object was to reduce Gaul to the form of a Roman province. He was likewise not without knowledge of the condition of the political parties at Rome, as is shown by his shrewd remark that the death of Cæsar, even if it involved the destruction of the Roman army, would find easy condonement in certain quarters of Rome. Of course, too much can be made out of this; probably he was speaking only from the gossip that had reached his ears that Cæsar was hated by a powerful faction at Rome, and there is no certainty that he had any genuine insight into the political revolution that was then in progress at Rome. Throughout his speech, however, we see that the mainspring of his character was overweening vanity, a blustering braggadocio, which marks little more than the ignorant bully of the northern forests. That he was without honor is shown by his attack on Cæsar's retinue at the hill conference, and by his treatment of the envoys sent him later at his own request. That he was without mercy is shown by his treatment of the helpless hostages in his control; that he was without genuine courage is shown by his headlong flight to the Rhine and the sacrifice of his family, friends and army. He was formidable therefore more in name than in reality, more in appearance than in fact. Actually then, he was not in the same

class as Dumnorix and Orgetorix, who were organizers and plotters; not to be rated, of course, with Vercingetorix who added to his patriotism the qualities of the strategist, the statesman and the hero.

It will thus be seen that, in spite of the small information that Cæsar appears to give as to the personality of his enemies, we can still get some pretty clear ideas of them from their actions, their words, and the report of them as given by Cæsar, and thus, by dint of sympathetic interpretation of his narrative, we can make these men real, and instead of shadows bring the flesh and blood before our eyes.

What I have done in the case of Orgetorix, Dumnorix, Diviciacus and Ariovistus can be done just as easily in the subsequent books in the case of the other chieftains who appear. Indutiomarus and Cingetorix in the fifth book remind us of Dumnorix and Diviciacus in the first; in the fifth book also Ambiorix will merit our attention, while in the seventh book — if a class has the good fortune to get so far — there are a number of heroes: Eporedorix, Viridomarus, and above all Vercingetorix, the last of the Gauls, who came so near to undoing all that Cæsar had done. He was by all odds the most magnetic chieftain and the doughtiest warrior, the most disinterested patriot who ever appeared in Gaul. Every action of his will repay close study, and the final end will arouse breathless interest, not merely for the Gauls but for Cæsar himself in his treatment of him.

The Battles in the "Bellum Gallicum"

But if Cæsar is an insufficient story teller when it comes to depicting the color of a man's skin, or the height of his figure, he is amply sufficient when a military movement is to be encountered or a battle described. The *Bellum Gallicum,* as has been so often emphasized, is a military history. What this means can be readily comprehended. All of Cæsar's views were directed to the battle, to the victory; all his plans to the overthrow of his enemies and the exaltation of his own power. So we want to bring clearly before our pupils Cæsar the general and the warrior. To do this I should not lay much stress on the art of war with which most of our editions are provided. Of course it is

well to know in a general way how many men may have formed a legion, how it was organized and officered, and the nature of the arms that the legionary was in the habit of carrying; but these are matters of general interest only to the student of Roman civilization rather than to the student of the *Bellum Gallicum;* for Cæsar introduced no important innovations into th existing art of war, except as in a sudden emergency he made changes for the moment, *e. g.,* when he put the men-at-arms from the tenth legion on horseback to guard his person, transitory changes which served for the particular crisis alone. What is most important to understand thoroughly, I think, is this: a fight in those days was practically a stand-up encounter between man and man; the arms were spears and swords, and the greater part of the work was done with swords, for, after the first throw of the javelins, the matter became at once one of cold steel. Bowmen and slingers formed no essential part of Cæsar's equipment, and, except in sieges, the work of war depended upon the stout heart and hand, the morale and endurance, of individuals in a fight at close quarters.

But here, as in every other kind of contest, good discipline counted for much, as did also the confidence in the commander and the full appreciation of what might befall them. It was the unknown that terrified, as is shown by the feeling of the soldiers before the battle with Ariovistus; and if this, the terror, was removed, the calmness and confidence of discipline was a sure sign of victory.

But if the duties of the legionary soldier were simple, the duties of the commander were manifold and hazardous. He must choose the position of advantage; he must arrange his troops so that rank should support rank, and reserve come in at the proper moment; he must decide upon the character and extent of fortification; and, above all, he must keep his eagle eye fixed upon the whole course of the battle, and be ready to take advantage of every phase, inspire the dispirited, support the weary, restrain the impetuous, and if occasion demanded risk his own life to stimulate his soldiers. The difference between Roman commanders lay just in this point, and the claim of Cæsar to be called a great captain depends upon the genius which marks all his military movements.

I have already alluded to the memorable scene in the second

book, where Cæsar's eye takes in at one glance all the elements in a disordered and doubtful fight, the lightning rapidity with which he noted every detail, and the no less amazing swiftness with which his mind grasped the fact that without one special effort all was lost. It was different from the ride of Sheridan, for Sheridan's ride was not dependent upon assured command of the situation, but upon personal pluck and bravery; but the elements of greatness were the same in each case, and Cæsar's act has been paralleled more than once in the annals of war.

The battle, however, is the great event of the campaign. It was, as it were, the catastrophe in the tragedy of war. To this all measures looked forward and, as a rule, this closed the campaign.

In his accounts of what he did Cæsar is so extremely careful that it is not difficult in most cases to bring the battle before the eye. Hence these parts of his narrative give opportunity for illuminating interpretation. As examples, I shall take again the two in the first book. The battle of the Helvetians is described in Chapters XXIV and XXVI. Cæsar had drawn the Helvetians into a pursuit of his own army, and had managed to inspire them with the view that he was afraid of them. He was thus enabled to secure the advantage of position; so he occupied a hill, leaving his cavalry to divert the enemy while he drew up his forces in line of battle midway down the hill. The line of battle he formed with veteran troops, leaving recruits and light-armed on the top of the hill, with orders to gather the baggage together and fortify the position. The Helvetians, seeing that Cæsar was preparing for battle, also gathered their baggage into one place. Then in dense array they came on, and having easily hurled back the cavalry, came charging in phalanx form up the hill against the first line of battle. This was a formidable battle for Cæsar's soldiers. He felt that it demanded particular efforts, so he first dismounted himself, and then made all his officers dismount, so that every one was on an equality. When the battle began the advantage was at once evident. The javelins which the soldiers discharged from their higher position broke immediately the phalanx formation of the enemy, so that the way was open to the Romans when they charged down with their trained swords. But the javelins did more; they pierced through many shields at once and, bending

in the blow, made it impossible for the Helvetians to tear their shields apart, so that many in desperation threw them away altogether and fought without their shields. Meanwhile, the seasoned Roman troops were pressing hard upon them, sword in hand, and, after fierce fighting, the Helvetians gave way and retreated nearly a mile to a lofty hill, with the Romans in pursuit. But now the conditions of position were reversed. The Romans were mounting the hill. Furthermore, as they turned to mount the hill, they left their flank exposed to the Helvetian rear guard of Tulingians, who promptly pushed forward to the attack. Here the value of the Roman discipline and battle formation showed itself. The third battle line instantly deployed to meet the attack on the flank; while the second, in support of the first, kept up the attack with the Helvetians, who, seeing the onset of the rear guard, had taken fresh courage and were again meeting the Romans with their early vigor. Cæsar remarks that the battle was long, doubtful and severe. And it must have been so, for it began at the seventh hour of the morning, and at evening only two sections of the enemy had finally begun to retreat. Nor was this retreat a flight. One side retired to the lofty hill, the other to the baggage. Very late at night, and after a long and serious struggle, the Romans got possession of the baggage and the camp. Even then, all who had retired to the hill and many others, to the number of 130,000, survived the battle, and marched swiftly away during the night, not in flight but in retreat, and four days afterward they reached the territory of the Lingones. Cæsar was so badly crippled that he spent three days in attending to the wounded and burying the dead of his troops, and only on the fourth day was able to go forward in pursuit.

The battle of the Germans under Ariovistus is told in much briefer style, partly because the events leading up to it were more important than the battle; partly because the danger, except from numbers, was not so great as in the case of the Helvetians. The style of fighting was also different in the battle with the Germans, for Cæsar was attacking, but the manner of action was much the same. We have the same triple formation which was so successful in the first battle. The Germans came out to meet the attack in large national groups and put their women in the wagons to inspire them. Cæsar did not dismount his officers this time, but, anticipating that brave deeds would

be accomplished, he put legati and quæstores in places where they could take account of individual prowess, and then himself started the fight on the right wing. The battle, owing to the ardor of the contestants, was a sword battle from the beginning. The left wing of the enemy was soon put to flight, but the right wing was hard pressed by weight of numbers, and disorder would have occurred if young Publius Crassus, in command of the cavalry, taking in the situation, had not ordered up the third line to assist the first. This settled the matter, and the enemy was soon in headlong flight, which they kept up as far as the Rhine.

But passing on, I want to draw attention to the style with which these battles are written. It is the style of narrative, not of description. Cæsar very rarely gives us any scenes; he gives us results. Accordingly, in the description of the battle with the Helvetians, as well as with Ariovistus, the tense employed is the aorist. These battles are accordingly no place to show the difference between imperfect and aorist tenses, because for practical purposes the imperfect does not appear; although in a few cases where it does appear it is, of course, properly used. So in Chapters XXIV to XXVI we have no case of an imperfect, omitting *erat,* in a principal clause, except one of *poterant* with a negative, which is equivalent to *potuerunt.* The three cases of imperfect tenses that are left are luminous, but they are all in dependent sentences. They show position or continuous action and bring in an instantaneous scene. Similarly, in Chapter LII only two cases of imperfect are found — one, *premebant* in a principal clause; the other, *versabatur* in a subordinate clause; both properly used. The rest are all aorists. In this, however, I may give rise to misinterpretation. There are some cases of *iussit* with present infinitives, and others of *coeperunt.* This gives us a chance to delay a moment and watch operations; but this was not in Cæsar's mind. He was only thinking of the movements.

Both the battle with the Helvetians and that with Ariovistus are typical of other engagements throughout the book. Some are more elaborately described, some have fewer preliminary movements, but it is very desirable in teaching that the pupil should be led to follow the narrative continually, so as to see the inevitableness of the battle, the careful provision that Cæsar makes,

the calculated rashness of his own movements, the clever control of the morale of his soldiers, and the complete success which followed this campaign of reason and confidence. In the events leading up to the battle are numerous little cameo pictures which enliven us; some of these I have touched upon, some have been made the occasion for illustration, as in the Gotha wall pictures.

In conclusion, I would emphasize that it is a mistake to allow our pupils to read page after page of the *Commentaries*, without any suggestion from us of the full effect of the narrative. Pupils will get a great deal, no doubt, even when unassisted; for Cæsar has the power to attract in a remarkable degree. But when we can help their intelligence with little effort on our part, it seems to me we are derelict in our obligations if we fail to do so.

Opinions will differ as to the amount of such interpretation as I have indicated, which may with profit be made before a class; and of course, different teachers will see different matters from those on which I have laid stress. For the indications that I have given above have been designed to stimulate independent study rather than to exhaust the subject. But of the value of a certain amount of such interpretation there are not likely to be two opinions; and if it is judiciously employed, I doubt much whether any pupil will find Cæsar either dry or uninteresting or without imagination or incapable of making his points clear.

Further, if a pupil reads Cæsar with even a slight appreciation of literary form, he will be better equipped not merely for the further study of the classics but for the study of literature in general, to which the classics should be but an introduction, even if the introduction may prove to be the most finished part of the whole.

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THE SPEYER SCHOOL

PART I

ITS HISTORY AND PURPOSE

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ANNOUNCEMENT OF VOLUME IV — 1903

The next issue of the RECORD, the number for January, 1903, will deal with "The Speyer School, Part II, Its Curriculum," by Professor Frank M. McMurry, Head of the Department of Elementary Education, Teachers College, and Jesse D. Burks, Acting Principal of the Speyer School.

There are also in preparation numbers of the TEACHERS COLLEGE RECORD on "Arithmetic in Elementary Schools," by Professor David Eugene Smith, Head of the Department of Mathematics, and Professor Frank M. McMurry, Teachers College; and on "Methods of Teaching French and German," according to the new or reform method, by Dr. Leopold Bahlsen, of Berlin, Lecturer on Methods of Teaching Modern Languages, Teachers College.

Other issues will discuss the principles which should govern the curriculum of primary schools, illustrated from outlines of courses as conducted in the Teachers College Schools, and followed by separate issues dealing with specific work in the First, Second, Third, and Fourth Grades.

Numbers concerning Kindergarten work and Music in Schools may also be expected.

Address all communications to

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Photograph from drawing
by E. A. Josselyn, Architect.

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TEACHERS COLLEGE RECORD

VOL. III NOVEMBER, 1902 No. 5

THE SPEYER SCHOOL

PART I. — ITS HISTORY AND PURPOSE

I. THE PURPOSE OF THE SPEYER SCHOOL

By DEAN JAMES E. RUSSELL

Professional training has for its aim the acquisition of the knowledge and skill required in professional service. The knowledge required relates to the ends to be attained, the nature of the materials to be worked upon, and the means and instruments to be employed; the required technical skill consists in the adaptation of the means to the given material and the use of the available instruments in such a way as to attain the desired ends. In the training of the lawyer the facts and principles of the law are matters of knowledge; the preparation of legal documents and court pleading imply technical skill. The medical student learns human anatomy and physiology, the normal functions of the human body, the variations engendered by injury, decay and disease, and the means which may be employed to restore health or alleviate suffering; he also acquires through practice in the dispensary, clinic and hospital the skill which converts the mere scholar into the licensed physician and surgeon. Knowledge alone cannot give professional standing; technical skill unless supported by superior knowledge and directed by a high moral purpose cannot render professional service.

The professional knowledge required in teaching (over and above the general culture required in all professions) consists (1) in the history and principles of education which define the ends to be attained, (2) in physiology, psychology, ethics and sociology, which disclose the nature of the child and his life in society, and (3) in the subjects employed in the school for purposes of instruction and in other means and instruments available in influencing child growth and development. The skill required in the professional teacher consists in the use of methods best calculated to secure through suitable means the highest ends attainable for any particular child under the conditions imposed by his nature and environment.

The skill which the teacher should have is no more a free gift of nature than is the knowledge of Latin, mathematics or psychology. The "born teacher" has the capacity to learn what is needed and the disposition to use his knowledge for the benefit of others. In the acquisition both of knowledge and of skill the intending teacher, like other professional students, can be greatly helped by competent instruction and guidance. It is always difficult to make good scholars even of willing students; it is even more difficult to convert good scholars into really efficient teachers. The person who knows precisely what should be done has taken the first long step towards its accomplishment, but no amount of knowledge will of itself make an artist. The successful sculptor must learn through actual experience the possibilities of himself and of his art. He may be self-taught, but most men have something to learn from the experience of others.

Teachers College gives instruction in most subjects employed in elementary and secondary education and in those departments directly concerned with the history and principles of education, educational psychology and school administration. These courses are intended to equip the intending teacher with the information of greatest value in school work. Skill in teaching is sought through the courses on the theory and practice of teaching and school management. These courses stand in closest touch with the work in the schools of observation and practice. They deal with the aim of instruction in the several subjects, their educational value, their place in the curriculum, the selection and arrangement of materials, supplementary references, methods of presentation,

observation and reports of lessons given by good teachers, and finally actual teaching under guidance of a master. The procedure is analogous to the didactic lecture, dispensary practice and work in clinic and hospital long familiar in the training of physicians.

It is important that teachers in training should have the opportunity to observe good teaching under favorable conditions in order to fix ideals and to establish a practicable standard of merit. The Horace Mann School serves this purpose in Teachers College. Professors in the College are supervisors of their respective subjects in the School; teachers are selected with a view to their ability to demonstrate what is deemed feasible in any grade or class. The School is not an ideal school; it may not be even a satisfactory model for other schools; but it represents the best that we have been able to do under the conditions imposed by pupils, nearly all of whom are preparing for college, and by professors who are determined to see that the several subjects of the curriculum are properly represented and well taught. The School belongs, therefore, to the conventional type; it must be conservative and with its equipment, financial support and teaching staff it ought certainly to be efficient.

The Horace Mann School cannot, it is apparent, meet all the demands of students who seek to acquire skill in teaching. They may observe good teaching in the Horace Mann School, may give assistance to the regular teachers and even have some practice in teaching, but the object for which the School exists (so far as the College student is concerned) would be lost if any appreciable disturbance in class work were occasioned by amateur teaching. The desire to protect the Horace Mann School, or, in other words, to keep it a typical school, is one reason why another school more flexible and less conventional should be established for the use of Teachers College students.

The Speyer School, which is a free school due to the generosity of Mr. and Mrs. James Speyer, is intended not only to complement the work of the Horace Mann School in furnishing opportunity for practice in teaching, but also to supplement other agencies of the College in promoting research and investigation in the field of public education. The kindergarten and elementary school will be open to College students who need criticism in teaching and class management. To this extent the school

is a "practice school," but in a wider sense it will be an experimental school. The officers in charge will be free to modify the curriculum within reasonable limits, to change the system of management and discipline as occasion may require, or to do anything that seems to promise greater efficiency in the school and better service for the community.

After four years' experience with the school, Professor McMurry believes we should lay greater stress upon the physical well-being of the children; hence the prominence given to this subject in this number of the RECORD. The question also arises whether we have made the best use of music; here, too, is a chance for experimentation. Much is being made of excursions for nature study and for the study of collections in public museums; something may be learned from such efforts that will be of service not only to the Speyer School but to other schools as well.

But there is a still wider field for experimentation than in the curriculum and methods of an elementary school. The entire field of public education is a subject for investigation. Our public schools are in session five or six hours a day, five days in the week and less than forty weeks in the year. On the whole, the public schools serve the community less than one fourth of the time available in the year and only a small portion of the community at that. School buildings are erected by the public for the purposes of education; such buildings are public property and ought to be used by all persons in the community who are seeking an education. Furthermore, the education of a community is something more than school instruction. School work designed for children is really only a small part of it. Whatever tends to elevate the people of a community, to inspire them with higher ideals, to help them to better living, is educational. Surely the public school falls far short of what it might do for the public welfare.

But what can be done for the education of a community more than is now done in the public schools? This is a proper question, and the Speyer School will undertake in part to answer it. The Speyer School proposes to place its entire plant at the disposal of the community after school hours afternoon and evening, and all day on Saturdays, holidays and during the regular vacations. The gymnasium and kindergarten room are so arranged as to

be easily used for public lectures, social meetings and entertainments. Boys' clubs, girls' clubs and mothers' meetings will be encouraged. The gymnasium, baths, and library will be open to the public when not actually needed for the school. Classes will be formed to meet afternoons and evenings in sewing, cooking, and housekeeping, in music, in free-hand and mechanical drawing and design, and in wood-working and other simple industrial arts. Regular night-school classes in academic subjects will be formed if there is a demand for them. In short, the purpose is to serve the community in every possible way and particularly to experiment in ways and means of bridging the gap between the close of public school work and the time when young men and women settle down to permanent employment at eighteen or twenty years of age.

If some of these plans succeed — even a few of them — the course of public education may be altered thereby; if by any chance all should fail or prove to be impracticable, others can profit from our mistakes. But whether we succeed or fail, the effort will not have been made in vain.

II. HISTORY OF THE SPEYER SCHOOL

By JESSE D. BURKS, ACTING PRINCIPAL

In a special report of Dean Russell to the President of Columbia University, dated November 10, 1898, occurs the following statement: "The Horace Mann School, as at present constituted, is incapable of meeting the just demands which are likely soon to be made upon it. . . . Some other means of experimentation and practice in teaching will be necessary if the College increases in numbers, — indeed, such a working laboratory is sorely needed at the present time. The Kindergarten Department has effected an alliance with the New York Free Kindergarten Association whereby students in the Kindergarten course may secure the necessary training in actual class-room teaching. It is imperative that similar opportunities be provided for student-teachers in other departments. It is probable that the establishment of a mission-school within easy reach of the College, if no other plan presents itself, would meet all requirements for many years to come. Such an undertaking I believe to be perfectly feasible. It should be both a support to the College and a blessing to the community in which it might be located. I recommend, therefore, that the Trustees authorize the establishment of such a 'practice school' whenever the Faculty deems it prudent and desirable to undertake the work." It is doubtful whether even the Dean at that time foresaw the real extent of the demands which the rapid expansion of the College was so soon to make upon the school contemplated in his recommendation. It is evident that we have here, however, the thought in outline that has since taken substantial and amplified form in the Speyer School.

The plan proposed by the Dean gave concrete form and emphasis to a feeling that for some time had been growing in the College. President Low in his address at Teachers College commencement, June 2, 1898, had vaguely implied such a plan when

Temporary Quarters of the Speyer School, 1899–1903.

One half of this building has been used for the Elementary grades and the free library. The children of grades two, three, four and five are shown in the photograph.

he said that "the Horace Mann School must be kept a model school for children without any regard to the training of teachers." For several years there had been conducted, in the parish house of St. Mary's Church in Lawrence street, a free Kindergarten with which, during part of the time, the College had maintained more or less close relations. The Brooks Alumnae of the Kindergarten Department of the College had taken an active part in the inauguration and maintenance of the enterprise and the Kindergarten Department had utilized it, to some extent, for observation purposes though not for practice teaching. Such a school had proven inadequate to the requirements of the College and all connection with it had been discontinued.

It was not long after the foregoing recommendation was made by the Dean that definite steps were taken toward the organization of the proposed school. Several plans and locations were considered by the projectors of the school and it was finally decided that the district centering about Lawrence street and Amsterdam avenue was most advantageous by reason of its proximity to the College and the density of its population. Furthermore, Rev. H. R. Hulse, the rector of St. Mary's Church, had made a request that Teachers College assume the direction and control of the Kindergarten in the parish. Arrangements were finally concluded whereby the College should undertake, with complete authority, the work of the Kindergarten and should have the use of the parish house temporarily for an elementary school and permanently for the Kindergarten.

In September 1899, the work of the Kindergarten was, accordingly, reorganized under the supervision of Miss Mary D. Runyon, director of the Kindergarten department of Teachers College. Miss Edith Mitchell, a graduate of the College, was appointed temporarily to conduct the work, with the assistance of students in the Kindergarten department. Miss Mitchell performed this service for about six weeks, when Miss Anne S. Blake was appointed to have permanent charge of the class. In this position, Miss Blake continued for over two years with growing success, when ill health compelled her to ask for a leave of absence. From Thanksgiving, 1901, to the close of the first term, the work of the Kindergarten was conducted wholly by students of Teachers College under the direction of Miss Runyon. In January, 1902, Miss Anna Gilchrist, critic teacher in the Phila-

delphia Normal School, was appointed to continue the work for the remainder of the year.

The task of inaugurating the new Elementary School was entrusted to Miss Amy Schüssler, a graduate of Teachers College, and, at that time, a teacher in the Horace Mann School. The lower floor of St. Mary's parish house was meagerly furnished with odds and ends no longer useful at the Horace Mann School and here, with eighteen pupils gathered from the neighborhood, Miss Schüssler launched the enterprise that later came to be known as the Speyer School.

The pupils at the beginning were not all of a promising character. A few came from St. Mary's Kindergarten. Some were sickly; some feeble-minded; some were backward children from public schools. There were many applications for the admission of defective children whose proper place was in special institutions. Some children of a stronger type would have entered the school, but for the objection of their parents to the half-day session which was the arrangement of the first year.

Many of the children in this group were too young or too immature to undertake even the ordinary work of the first school-year. It was consequently necessary to conduct sub-primary work of such character as to make possible, for the succeeding year, regular first-grade work. The peculiar problem at this point, therefore, was to adapt the Kindergarten idea to the requirements of a small ungraded school in which the children were of varying degrees of immaturity.

Aside from the parents whose children were in the school, few members of the community were at all interested in the new undertaking and even these parents, at first, comprehended only in a faint way the purpose of the school. From the beginning, however, Miss Schüssler, in coöperation with Miss Blake, made a strong effort to bring the school into close relation with the community life. Meetings of the parents were inaugurated at the very outset. Through these meetings and through the frequent visits of the teachers to the homes of the parents, the significance of the school as a social center came gradually to be appreciated and the influence of the school to be widened. The relations established in the parents' meetings have always been cordial and helpful; and both the interest and the attendance have steadily increased.

A few months after the opening of the school, it became necessary to secure, for the primary class, more commodious quarters than were afforded by the parish house. One half of a double-dwelling house on 129th street was leased and in this house the main part of the school work has since then been conducted.

At the close of the first year of the school's life, a free library was opened in the building for the use of residents in the neighborhood. This library has, from the time of its establishment, been conducted and in large measure equipped and supported by the Alumni of Teachers College. It is on this account designated as Teachers College Alumni Library. The Alumni Association has each year contributed $100 for the purchase of books and has furnished two attendants for two afternoons and one evening of each week to advise readers concerning the choice and use of books.

There were at first less than one hundred books in the library and the "readers" were largely small children whose parents had seized the opportunity of leaving them in the care of the attendants during the open hours of the library. Gradually the library has come to be known and appreciated among the more mature residents. There are now over 750 volumes on the shelves and over 280 holders of cards. During the year ending June, 1902, the circulation of books was 1828. The library seems destined to be a continually growing factor in the community, especially in view of the fact that there is no other public library in this part of the city.

The Dean's report for the year ending June 30, 1899, announces that "With the approval and support of the Trustees an Experimental School has been established within ten minutes' walk of the College" and, in commenting on the significance of this step, proceeds: "It is interesting to note, in this connection, that in the establishment of a free school in a densely populated section of the city the College is reverting to the policy that prompted its own foundation. The work of the Industrial Education Association was in part precisely what is sought for in the new Experimental School. Not only will instruction be given in the usual school subjects, but a special effort will be made to interest the children of the neighborhood in the industrial and domestic arts, in the fine arts, and in those occupations and recreations which make for upright moral character and good

citizenship. With a suitable building and adequate endowment it would be possible to expand what is now planned as an Experimental School into an Experimental College Settlement, with the further purpose of promoting intelligent study of all forms of public education and social service. Such an institution, standing in active coöperation with the other departments of Teachers College, might easily surpass in the extent of its influence and in the magnitude of its work the fondest dreams of its founders."

The school reopened in September, 1900, with thirty-one pupils in the elementary school, and thirty in the Kindergarten. Closer grading of the pupils was introduced that year, so that the first three grades were represented; by far the largest number being assigned to the first grade. With better organization, there naturally came marked improvement both in the subject-matter and in the methods of instruction.

During this year new and greater possibilities for the school began to appear and take substantial form. From the first, Dean Russell had seen the undeveloped significance of such a school as a factor in the solution of some of the most pressing and important educational problems. To the development of the larger possibilities of the school, he now directed his attention. The result can best be indicated by quoting from his report for the year ending June, 1901: "For three successive years I have pointed out in my annual report the need of an experimental school to supplement the Horace Mann Schools, and to further research in public-school administration. It is peculiarly gratifying, therefore, to record the gift of $100,000 by Mr. and Mrs. James Speyer for the purchase of a site and the erection of a suitable building. Two lots have been purchased on Lawrence street, near Amsterdam avenue, and plans for a building have been prepared by Mr. E. A. Josselyn, architect. One condition of the gift is that annually two trained settlement workers shall be appointed on the nomination of the Council of the University Settlement Society of New York City. This foreshadows the effort to make the school of service to the community over and above the class-instruction of children. The plans provide for class-rooms for 240 children in eight elementary grades and 50 in a Kindergarten, and also for a gymnasium and baths, library and reading-room, club-rooms and rooms for sewing, cooking, and

manual training, all of which will be open to the public as well as to the children of the school. A unique feature is the inclusion of living apartments for the instructors and officers, in order that the building may be open and under supervision every day and evening in the year. This school, which has been appropriately designated by the Trustees 'The Speyer School,' will be opened in the fall of 1902, and it should speedily become one of the most important experiment stations in the field of American education."

The year 1901-1902 was marked by the addition of another teacher in the person of Miss Julia Martin, a graduate of the Michigan Normal College and later a student at Teachers College. The character of children entering the school showed gratifying improvement, and the total enrollment increased to fifty, distributed somewhat unequally among four grades. Miss Martin assumed charge of the first and second grades, while Miss Schüssler conducted the work of the third and fourth grades.

Professor F. M. McMurry, who from the foundation of the school had taken a keenly sympathetic interest in it as a field for experimental work and practice teaching, was this year made acting principal of the elementary school and Kindergarten. Under his supervision, the curriculum was developed and adapted more nearly to the requirements of the community surrounding the school; the scope of practical work on the part of Teachers College students was greatly extended and its method defined and systematized; and wide opportunity was afforded graduate students of proper qualifications, for the experimental study of special problems relating to the matter and methods appropriate to an elementary school curriculum.

Enrollment by Years

Year	1899-1900		1900–1901				1901–1902					1902–1903					
Grade	Kinder-garten	Sub-Primary	Kinder-garten	I	II	III	Kinder-garten	I	II	III	IV	Kinder-garten	I	II	III	IV	V
Boys	28	6	16	7	2	3	19	9	4	6	5	11	6	5	3	7	3
Girls	26	12	14	16	1	2	28	7	10	7	2	17	16	6	10	3	4
Totals.	54	18	30	23	3	5	47	16	14	13	7	28	22	11	13	10	7
Aggregate . .	54	18	30	31			47	50				28	73				

The year 1902-1903 opens with gratifying promise. The school has now four teachers of experience, ability, and devotion, though it must be recorded with regret that Miss Blake and Miss Martin have been compelled by ill health to retire at least temporarily. The range of work has been enlarged to five elementary grades and the Kindergarten, with a total membership of ninety-one. With the increase in numbers, there has been a corresponding improvement in the character and ability of the children attending the school. The new building is approaching completion and will soon furnish a much needed relief from the cramped conditions under which the school has hitherto conducted its work. More and more the school is commanding the attention and confidence of the people of the neighborhood and is becoming the center of a larger community life which, under more favorable circumstances, will be greatly developed. From the administrative point of view, the Speyer School offers incalculable opportunities for study, and bids fair, in the words of Dean Russell, to " become one of the most important experiment stations in the field of American education."

III THE ENVIRONMENT OF THE SCHOOL

By JESSE D. BURKS, ACTING PRINCIPAL

I. The Historical Background

The Speyer School is in the center of a district rich in historical association and in contemporary interest. Between Harlem (now Washington) Heights on the north and Bloomingdale (now Morningside) Heights on the south, lies the Manhattanville depression, known in Colonial days as the "Hollow Way." At the foot of 130th street was a little cove in the Hudson river where the "landing" was located. On the tide land skirting this cove, was "Matje David's Vly," or salt meadow, the curious name of which points unmistakably back to the period of Dutch settlement. This "Round Meadow" and "Harlem Cove," as the little bay was called in later days, have long since disappeared in the process of filling in and straightening out the river front.

Associations with the Revolutionary War

The region in and about the valley where the school is located formed the arena of one of the dramatic events of the Revolutionary War. After the abandonment of Long Island and the subsequent evacuation of lower New York, Washington's forces, followed closely by those of Lord Howe, retreated up Manhattan Island, resolved to hold at least the northern end of the island. By the evening of September 15, 1776, the last of the American Army had taken up a strong position on Harlem Heights, concealed by woods and knolls and protected by the rocky heights rising abruptly from the Hollow Way.

Early on the morning of September 16, Washington dispatched a force of one hundred and twenty Rangers, under Colonel Knowlton, to discover the exact position of the British lines to the south, on the heights of Bloomingdale. The British were

screened by the woods and rocky hills, but Knowlton came upon their outposts near where 106th street now crosses Riverside Drive. There was a brisk skirmish in which Knowlton lost ten of his small force. The Continentals retreated toward their own lines, followed closely by the Redcoats. As the Americans disappeared across the valley where the Speyer School now stands, the British watched them from the top of the hill now surmounted by Grant's Tomb. General Reed, an eye-witness of this incident, wrote concerning it: "The enemy appeared in open view and in the most insulting manner sounded their bugle horns as is usual after a Fox-chase. I never felt such a sensation before — it seemed to crown our disgrace."

At the "Point of Rocks," still rising boldly above the "Harlem Flats" at Convent avenue and 127th street, Washington had taken his own station to direct affairs. He had no desire to precipitate a general engagement, but he determined upon a stroke which, if successful, would, as he wrote, serve "to recover that military ardour, which is of the utmost moment to an army." His plan was to entrap the British skirmishers in the Hollow Way and capture them.

A small force was sent out to make a feint in front of the hill from which the British had sounded their bugle taunt. The British skirmishers immediately accepted the challenge and came running down the hill almost to the bottom. There, on the very spot where the Speyer School is temporarily quartered, the Battle of Harlem Heights was begun.

Meanwhile, Washington had dispatched a strong force under Colonel Knowlton which, by taking a circuitous route through the woods, was to close in behind the British skirmishers and hem them in. The Americans in the hollow apparently pressed the fighting a little more eagerly than was called for by Washington's stratagem, and forced the British a little way up the hill. Consequently, when Colonel Knowlton emerged from the woods on the rocky ridge that runs along the Boulevard from 124th street towards the Horace Mann School, he found himself not in the rear of the enemy, but immediately on their flank. Knowlton's men joined at once in the firing. Within a few minutes, the dashing Colonel himself fell with a mortal wound at the summit of the ridge and, when asked if he was badly wounded, replied, "I do not value my life if we do but get the day."

View from Teachers College, looking North.

Amsterdam Avenue at the right; the Hudson River at the left; 123d street in the foreground: Washington Heights in the background. Location of the new Speyer School indicated by the cross near the centre of the picture. Probably 30,000 people live in the district shown

The movement now developed into a general attack. American reinforcements were brought up until there were 1800 of the Continental troops engaged. The British were forced back to the top of the hill where there was a large buckwheat field just south of the ground now occupied by Barnard College. In this field the British were reinforced and the main part of the battle was waged. The spirited contest continued from noon until two o'clock, when the British forces were driven from the field back to their own lines. Later in the afternoon the Americans returned to their camp, flushed with the ardor of their first success since Concord, seventeen months before.

The American loss in killed and wounded was about 130 and the British considerably larger. Judged by its material gain, the battle was of little consequence. In speaking of its effects, however, Washington said it had "prodigiously" cheered the failing spirits of his men, and must bring "many salutary consequences." Among the consequences was an immediate stimulation of enthusiasm on the part of Congress for a plan of reorganizing the army on a permanent and effective basis.

On the Boulevard side of one of the buildings of Columbia University, opposite 117th street, a bronze tablet has been fittingly placed "to commemorate the Battle of Harlem Heights, won by Washington's troops on this site."

There are other marks that give vividness to the association of this region with the events of the Revolution. One of the most notable of these is the stately mansion on Washington Heights at 161st street, which is said to be the only remaining example of Colonial architecture in New York. This mansion served as Washington's headquarters from September 15 to October 20, when he was compelled by a movement of General Howe to retire to White Plains. Another such mark is Fort Washington, on the Hudson river side of the Island, the remains of which are to be seen near 175th street. When Washington retreated to White Plains, this fort was garrisoned by 2500 men, including Knowlton's Rangers. On the return of the British from White Plains, the fort was attacked from four directions and the garrison surrendered.

Associations with the War of 1812

There remain in the vicinity of the school a few landmarks associated with the War of 1812. On one corner of Fayerweather Hall of Columbia University, there is a bronze tablet "To commemorate New York City defences in the War of 1812: Barrier Gate, [at] McGowan's Pass; Barrier Gate, [at] Manhattanville; Forts Clinton, Fish and Haight; and three stone towers." The forts and block-houses named on the tablet formed the northern line of defences of the city during the war. One of the forts stood on the rocky ridge where Colonel Knowlton fell in the battle of Harlem Heights. One of the block-houses is still to be seen at the northern end of Morningside Park, and another in the upper part of Central Park. The other defences have disappeared as the city has extended its bounds.

Manhattanville as a Village

At the time of the Revolutionary War, and for many years after, Manhattanville was little more than the name for the place where there was a crossing of two old country lanes. One of these lanes, represented to-day by Old Broadway and Claremont avenue, crossed the valley and joined the Bloomingdale road on the heights a mile or more to the south. The other ran along the present line of Manhattan street, from the Kingsbridge road, near Harlem, to the landing at Matje David's Vly.

Along the Bloomingdale road (the Boulevard of to-day) were many country homes of New York gentlemen, the estates increasing in size as the distance from the city increased. By 1825, the Bloomingdale road had been extended along the line of the old lane until it joined the Kingsbridge road on Washington Heights, and Manhattanville had grown into a distinct village center.

Grouped around the small village were several estates of considerable extent. On the hill to the north-west of the cross-roads (Old Broadway and Lawrence street) were the lands of Cornelius Lawrence. To the east of the Bloomingdale road, in the valley, was the estate of Jacob Schieffelin, beyond which, on the site now occupied by a convent, was the country place of the Lorillards of tobacco fame. On the slopes of Claremont hill,

south of the village and west of the Bloomingdale road, was the ten-acre farm and orchard of Mr. Buckley, now represented by the irregularly shaped property, between Manhattan and 127th streets, which still bears many of the characteristic marks of a country place. On the crest of the hill above the orchard of Mr. Buckley, overlooking the river, was Claremont, the residence of the British minister to the United States in the early years of the century, and afterwards of Louis Bonaparte when he retired to this country after the downfall of Napoleon. (See map, following p. 26.)

In 1829, Anthony Tiemann and his son Daniel F. Tiemann bought the Buckley place and built the paint factory that stands on the lower part of this property near the river. In establishing this large industry in Manhattanville, the Tiemanns brought with them probably fifty German workmen and their families. This was the beginning of the industrial development of the community and accounts, in part, for the very large proportion of Germans that is still to be found in the population.

The village of Manhattanville has long since lost its separate identity in the rising tide of New York's greatness, but here and there are to be seen landmarks of various kinds that have resisted the encroachments of the growing city and tell a story of earlier days. Among these is part of the Bloomingdale road which can be clearly traced from 114th street, a little to the west of Claremont avenue, along the line indicated on the map, to 125th street, where its course is lost to reappear again beyond 129th street as Old Broadway. It was over this road that a lumbering four-horse stage-coach carried passengers between Manhattanville and New York during the earlier half of the last century. It was a matter of an hour and a half by this route to reach 32d street, where connection was made with the Broadway stages for "down town."

Other reminders of the period of village life are the low two-storied wooden houses in Lawrence street and Old Broadway, which furnish homes for some of the children of the Speyer School. Opposite the new school building stands St. Mary's Episcopal Church, with its parish house and rectory. This church was organized, under the inspiration of Alexander Hamilton, very early in the last century. The present building was erected in 1824 and since then has been the only Protestant church in the imme-

diate neighborhood. Near the front entrance of the church can be seen the family vault of the Schieffelins who donated the site on which the church stands. The country house of Alexander Hamilton, in which this church was probably organized, still stands at Convent avenue near 141st street. The original site of the house is on the opposite side of Convent avenue and is marked by several of the thirteen trees that Hamilton planted to symbolize the thirteen colonies. (Numbers 50 and 51 on the map.)

Lawrence street, on which is located the new school building, was the principal thoroughfare of the village. Near by the school building (number 106) still may be seen the old town hall which modern commercial demands have converted into a blacksmith shop.

2. The Geographical and Industrial Environment

The level of the narrow valley in which the school building stands is but slightly above that of the sea. To the north and south the confining hills rise somewhat abruptly to a height of about 200 feet, the distance from crest to crest being about a mile. The configuration of the land obviously determined the location of the manufacturing and trading industries, and also the direction of the oldest streets, among which Lawrence and Manhattan streets are now the most conspicuous. A half-mile to the east of the Hudson river the valley rapidly widens into the Harlem basin, which extends to the East river. The narrow passage along the line of Manhattan street thus furnishes the natural transportation route from the harbor on the Hudson river to the markets of Harlem.

The hills that rise to the north and south of this valley are marked by rocky ledges and cliffs, wooded slopes, natural water courses, and other land features of typical character. The exposed rocks on the summit of these hills bear well defined evidence of glacial action.

From the roof of the school building, or from higher points on the hills near by, a magnificent panorama is opened to view. Far to the north, the broad peaceful Hudson disappears behind a bold headland, beyond which the blue outlines of the Highlands are dimly traced on the horizon. A little to the east rise the wooded hills of Westchester County, while further east lies

Long Island Sound with Long Island stretched out beyond. To the west, just across the river, are the precipitous heights of the Palisades, surmounted by the rolling lands and wild woods of New Jersey's shore line. Disappearing toward the south, between the confining courses of the two waterways, stretches the unending mass of city blocks, in dense array, springing here and there into pinnacles and spires or mounting abruptly into domes and mighty towers.

Within five minutes' walk from the school are three public parks furnishing opportunities for the observation of many natural and artificial features of landscape, such as open lawns, wooded areas, patches of shrubbery and flowers, hill slopes, and rocky cliffs. At the Bronx Park, reached easily by elevated cars, there is a still greater variety of natural features, including lakes, water courses, spacious meadows, and hills of considerable height. In this park, as well as in Central Park, there is a large collection of wild animals and birds from all parts of the world, and a botanical garden of unusual variety.

A few blocks to the west is the water front of the Hudson river, furnishing abundant opportunity for a first-hand study of the principal types of transportation and kindred activities. Here are to be found a ferry-boat plying regularly to and from the New Jersey shore; an important freight station of the New York Central Railway; a great variety of shipping, including coal, lumber, and grain vessels; freight-laden boats from the Erie Canal, constantly passing toward the great markets further down the river; small craft of many kinds for pleasure and for commerce; and steamboats, for passengers and freight, plying between New York and Albany. Close by this shipping center are the wholesale markets and the manufacturing industries that are related to the shipping of the harbor, the exact location of which is indicated on the map of the surrounding district (following page 26).

On Amsterdam avenue and Manhattan street, there is an almost endless variety of retail stores and small industries, available for illustrative purposes in the work of the school. No attempt has been made to indicate, on the map, the location of these, as they are quite easily found.

These are the more obvious and striking features of the physical environment of the school. It is clear that there is, within easy

reach, an unusually rich and extensive body of material that can be utilized to give vitality and vividness to school work. The variety of physiographic features should prove a constant source of instructive delight in the teaching of geography. A few hours spent by a class, under intelligent leadership, in the study of the harbor and its surroundings, within ten minutes' walk of the school, should result in a clearer notion of "seaport town," "wholesale market," or "manufacturing community," than could be gained in a much longer time devoted to the study of these topics after the traditional text-book fashion.

3. The Social Environment

The section of New York represented by the map (following p. 26) corresponds closely with the thirty-first police precinct of the city. In area it is one of the largest of the eighty-two police precincts of Greater New York, being two miles in length and somewhat over a mile in width. A very large proportion of the area included in this district, especially that on the hills to the north and south of the valley where the school is located, is still unoccupied. A large part of such land on these hills as is occupied either lies in public parks or is held in tracts of considerable area by educational and charitable institutions. It will thus be seen that the mass of the 150,000 people living in the district contiguous to the school is compressed into the relatively small area situated on the floor of the narrow valley. While, therefore, the density of population for the district as a whole, compared with that of other parts of the city, is not great, within this central basin it is much greater than would be indicated by the figures for the whole section.

The population, within the range of the school's greatest influence, is very largely German, with a considerable proportion of Irish, Italian, and Russian elements. There is also a substantial element of English-American birth. The accompanying table gives an accurate statement of the parentage of the children in the school, from which may be formed an approximate idea of the distribution of nationalities in the community.

Nationality and Occupation of Pupils' Parents *

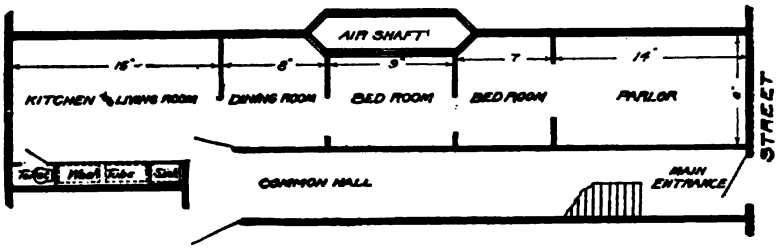
Grade	Nationality of Families					Occupation of Father							
	German	English (American)	Irish	Russian	Others	Mechanic Trades	Unskilled Labor	Street Car Service	Factory Labor	Proprietor Small Store	Bakery Business	Police Service	Others
Kindergarten . .	20	3	2	0	3	9	2	2	0	1	2	2	10
Grade I	10	9	2	0	1	3	3	2	2	4	3	0	5
Grades II and III	16	4	4	2	0	6	3	0	3	3	4	1	4
Grades IV and V	8	8	1	0	0	2	0	4	1	2	1	1	6
Totals	54	24	9	2	4	20	8	8	6	10	10	4	25

* In the few cases where the father's nationality is different from the mother's, that of the father alone is given. Where the father is dead, the mother's occupation is counted.

The conditions of life which, in most communities, favor the development of a well-ordered family life, of wholesome social intercourse, and of active participation in affairs of civic interest, are here very largely absent. Practically no one in this community occupies a house that he can call his own save by temporary right of lease, often from month to month. There is scarcely a building in the whole section occupied by a single family. Often as many as twenty families are grouped in a single, five-storied building, all using the same street entrance, the same stairs, the same hallways; though each family, as a rule, occupies the whole of an independent flat within the building. Few men living in the district pay any direct tax, municipal, county, or state. There is, accordingly, a lack of the powerful influence of direct taxation to keep men reminded of their individual relations to civil government. There are no beer gardens or other places of amusement of the kind that might bring the families of the community together for social intercourse. There are three small churches in the neighborhood, but naturally these cannot serve as social centers for a very large percentage of the population.

Besides the homes, then, there remain for the great mass of the people only the saloons as centers of social life. Of such centers there is no lack; but even admitting the value of saloons as social centers, in the absence of anything more wholesome, the fact remains that they cannot meet the social needs of the community as a whole. There is no place here for the women, the girls, and the small boys. Therefore the helpful spontaneous

relations of complete, well centered family life; the humanizing association of families as wholes with other family groups; and the liberalizing influence of a strong, healthy community spirit, not only are not fostered but must always be positively broken down by the saloon as it is now conducted.



Plan of a Typical Flat.

When we turn to the homes themselves, we fail still to find conditions distinctly favorable to the development of a wholesome and active neighborly spirit or of a stable family unity. The drawing given above represents a fairly typical dwelling-place for a family of from five to eight members in this community. It will be noticed that there is no private hall in this flat and that, consequently, in order to go from the kitchen to the front room one must pass through all the other rooms. Commonly the doors are removed from their hinges in such a flat as this, so that the rooms form a continuous passage from one end to the other. By this device the annoyance of opening and closing doors in narrow quarters is avoided and the whole series of rooms is warmed by means of the coal stove in the kitchen. The lightning and ventilation of the three inner rooms is provided for by the air shaft, as indicated in the drawing. Where the flat is on the lower floor of a five-storied building, the lighting afforded by the shaft is practically nothing, and the ventilation frequently worse than none at all. There are usually five floors in a building with two, three, or four flats on each floor; the arrangement varying with the size and shape of the floor space. The rent of such a flat as that described is about fourteen dollars a month.

There are, of course, many flats in the district that are distinctly better than the type represented in the drawing. Many have private halls which give access to each room independently, thus making possible a degree of privacy otherwise impracticable.

Even in such flats, however, the lightning and ventilation of the inner rooms is almost wholly dependent on air shafts. Steam heat and hot water are provided for these flats from a common plant by the owner of the building. This is not the case with the cheaper and more common type of flats before described.

But while there are many flats more or less superior to the type presented in the drawing, there is a very large class distinctly below it. Numbers of the frame-buildings designed originally for a single family each, have been converted into tenement houses and are now occupied, each by three or four families. Such an arrangement results in serious over-crowding and makes impossible a high degree of privacy and independence for separate families. But the chief source of danger to health lies in the inadequate and defective plumbing and sanitary equipment of these improvised tenements.

Many special adaptations of the social, economic, and personal aspects of life are necessitated by the peculiar conditions that have been described. On account of the small size and arrangement of the rooms, the flats do not lend themselves readily to social purposes. The people, young and old alike, are consequently forced into the streets for many diversions and pursuits that, under other circumstances, naturally center about the home. Neighborhood gossip, maternal discussion of questions concerning claims and injuries of disputing children, passing the time of day, and other familiar features of a highly developed social order exhibit themselves, in the absence of front yards and back fences, on the common stage of the open street. The children carry on their games and sports on this same meeting-ground, when the weather at all permits, and at other times crowd into the contracted and unpromising quarters afforded by the flats. There being little or no space available for storage purposes, there is a widespread practice of buying household supplies in very small quantities. Coal, for example, is usually bought by the bucket at prices that make the cost about double that of coal bought in ton lots. Other supplies are purchased similarly in small quantities, often at prices relatively as high as that paid for coal. Such facts, taken with the high rents that prevail throughout the district, mean that a very large part of the family income must go for the bare necessities of food and shelter, leaving a correspondingly small amount for clothing, for the adorn-

ment of the home, and for the many comforts and conveniences that are often considered essential to happiness. The inevitable tendency of such conditions is to emphasize the importance of present needs at the expense of proper provision for future contingencies.

It is a significant commentary on the strength and persistence of the native social instincts of mankind that, despite all of the conditions unfavorable to social intercourse in this neighborhood, there are nevertheless found a surprising number of touching manifestations of companionship, sympathy, and human kindness. On the crowded streets, in the marketplaces, on the housetops, and from window to window of adjoining flats, friendly and helpful intercourse bears witness to the continuing truth of Aristotle's dictum that "man is by nature a social being."

In view of the striking lack of unifying and socializing influences in the community we are considering, there are obvious possibilities of usefulness for the school that lie entirely outside the traditional field of school activity. Evening classes in literature, science, and special subjects such as cooking, sewing, stenography, and book-keeping; debating societies; gymnasium classes; mothers' clubs; parents' meetings; library privileges; lectures, musical programs, and other forms of entertainment; Sunday school; social gatherings for neighborly intercourse — these are among the features that may give the school a large and significant place in the life of the community. Indeed, it may not be going too far to say that the chief service of the school is to be found in the opportunities and interests that it offers to the adult population. It is certain, at least, that the authorities of the school must fairly face the problem of the true responsibility of the school toward the adults as well as toward the children of the community.

Tradition has given the common school its usual field of activity and the subject-matter of its curriculum. Such matters as personal cleanliness, the care of the home, the hygiene of cooking, the necessity of economy and of provision for the future, and many of the most significant facts of physiology, have heretofore remained very largely outside the field with which the school was directly concerned. The demands of this community with respect to these and many other similar matters is evident. The issue is clear, then, between an aim furnished ready-made by

tradition and one determined primarily by the social needs of a large and important community. There can be no more proper nor more urgent claim upon educational thought than the right settlement of this issue.

4. Key to Map of the District Surrounding the School

Note: The brief explanation appended to the name of each of the points of interest is intended merely to suggest the value of the point with respect to the work of the school. Neither the list of points nor the accompanying explanations are by any means exhaustive.

1. Tomb of General Grant: Important symbol of national reverence for a military hero. Elaborate edifice of granite with handsome marble interior.

2. Claremont Casino: Modeled after Lord Clives' historic "Claremont" of Surrey, England. Residence of the British Minister at the beginning of the nineteenth century; later of Joseph Bonaparte.

3. Boat Houses: Many small craft of various types for rent.

4. Recreation Pier: One of a system of such piers, constructed and supported by the city. Music furnished on summer evenings.

5. Ferry Slip: The ferry boat furnishes easy access to the wild woods and the Palisades of the New Jersey shore.

6. Railroad Freight House: Seventy cars of dressed meat received weekly; 13 cars of milk daily; and considerable quantities of hay, grain, potatoes, and other farm products at irregular intervals.

7. Wholesale Meat Houses: Ten houses, supplying the retailers in the district between 80th street and the Harlem river, receive weekly dressed meat as follows: 1,800 cattle, 10,000 sheep, 500 hogs.

8. Harbor and Docks: Coal, building-stone, and a variety of other products constantly received. Types of freight-carrying craft, especially barges, may be seen at any time.

9. Coal Bunkers: Illustrating the methods of receiving and handling large quantities of coal. Capacity, 3,000 tons. Annual amount received, 125,000 tons.

10. Street Cleaning Dump: Showing the disposition made of garbage and of refuse collected from the city streets. Almost all of this matter is saved and utilized.

11. Line of Old Bloomingdale Road: Of interest in the study of transportation; illustrating contrast between country roads and city streets; also emphasizing the growth of the city and the absorption of villages.

12. Battlefield of Harlem Heights: Lends interest and vividness to the local part in Revolutionary history. Tablet on Columbia University building, opposite 117th street.

13. BARNARD COLLEGE: Illustration of a specialized component part of a great corporation.

14. SITE OF OLD BUCKLEY ORCHARD: Showing the transformation of rural conditions by city life. A few apple-trees are still standing.

15. TIEMANN HOMESTEAD: Type of the better class of country farm houses; of interest as an historic landmark.

16. TIEMANN COLOR WORKS: The first large industry established in Manhattanville. A variety of materials is used in the manufacture of colors for paints: Oak bark, from Virginia, for brown and yellow; logwood, from the West Indies, for black and brown; lima wood, from South America, for maroon and red lake; prussiate of potash and copperas, for Prussian blue; nitrate of lead and bi-chromate of potash, for yellow; mercury and sulphur, for English vermillion.

17. WORSTED FACTORY: Uses 33,000 pounds of domestic and imported wool a week in the manufacture of 15,000 pounds of worsted yarn which is used exclusively in the manufacture of cloth, chiefly in New England. 200 employes in the factory.

18. WOOD WORKING FACTORY: Manufactures all kinds of house trimming and interior cabinet work, from every variety of commercial lumber.

19. GAS-PUMPING STATION: Storage tank of 2,037,000 cu. ft. capacity supplies this part of the city with gas for light and heat.

20. GROUP OF OLD STYLE HOUSES: Large frame structures illustrating the suburban architecture of half a century ago.

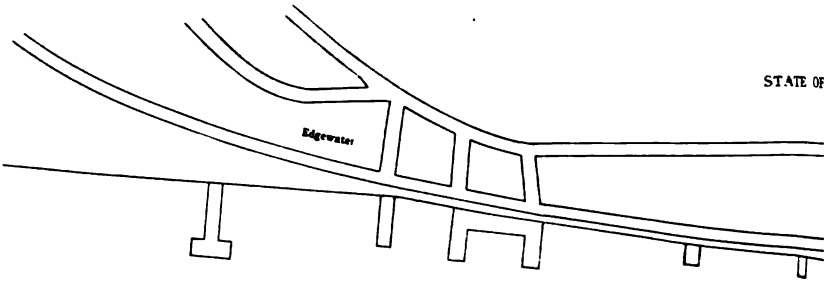
21. VEGETABLE GARDENS: Raising for commerce large quantities of garden truck; furnishing examples of many typical rural processes.

22. COLUMBIA UNIVERSITY: The buildings furnish fine examples of dignified architectural style; the library especially is a splendid type of classic architecture. A class might well be taken on an excursion through the library to enforce some ideas of the relative importance of books in modern culture. The importance of the museum is noted elsewhere. (See p. 31.) The wooded campus, with its many gray squirrels and birds, furnishes as good an illustration as can be found near by, of the native woods that once covered this part of Manhattan Island.

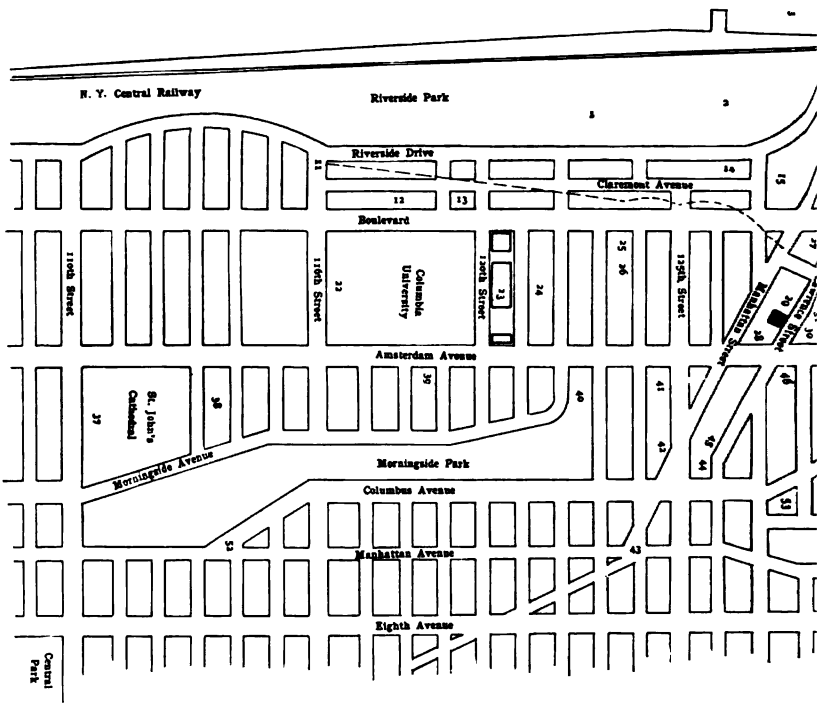
23. TEACHERS COLLEGE: Many of the departments have material of great value available for use in the Speyer School; this is especially true of the Educational Museum, and the departments of Domestic Art, Domestic Science, Manual Training, Art, and Geography. (See p. 29.) The Chapel is impressive for its richness of wall decoration. The plants for heating, lighting, and ventilation are complete and may be studied as models. The Horace Mann Schools furnish most of the elements of a complete modern school system. The dormitory building is the nearest approach, in this vicinity, to one of the great down-town buildings.

24. STONE FENCES AND SMALL WOODEN HOUSES: Many of the elements of a farm may be made clear by a visit to these places. Cows, goats, chickens, and other domestic animals may usually be seen in the vacant lots. A fairly typical barn-yard is connected with one of the places.

25. SITE OF FORT LAIGHT: One of the northern line of New York's



HUDSON RIVER



Drawn by L. Rouillion, Teachers College.

Map of District su

defenses in the War of 1812. Also the point where Colonel Knowlton fell in the Battle of Harlem Heights, 1776.

26. Old Spring of Water: Once furnished water for the small houses that stand near by. Several trees of an old orchard stand near the spring.

27. Lumber Yard: Great variety of hard and soft woods from all parts of the United States and Canada, including unsawed spruce timber.

28. Small Stable: Situated in a cellar under a hay and grain store. Approaches in type the stable of a small farm.

29. The Speyer School: A full description of the school and its resources is given in this number of the Record.

30. Fire Engine House: Full equipment of a station of the city fire department. Quarters of the firemen upstairs.

31. St. Mary's Church: One of the landmarks of old Manhattanville (erected 1824). The yard of this church is the nearest approach, in the neighborhood, to the front yard of a private home in a small town.

32. Old Speyer School: One of the old residences of Manhattanville, formerly known as the Mansion House; used as quarters for the school, 1898-1903.

33. J. Hood Wright Hospital: An emergency hospital whose ambulance service covers a district slightly larger than that represented by the map. During 1902 there were 2,210 ambulance calls; 1,176 patients treated in the hospital, of whom 166 (14 per cent.) died. Besides these hospital cases, there were 3,701 patients treated in the dispensary, 1,390 in the emergency ward, and 513 by the ambulance surgeon. The hospital employs 17 nurses. The expenses for the year were $28,866.

34. Manhattan College: A Catholic institution for boys, with a church on the grounds.

35. Brady's Woods: A rough wooded area to which the traditional name persistently clings.

36. Hebrew Orphan Asylum: A type of a very large home for orphans; privately endowed and supported.

37. St. John's Cathedral: A magnificent edifice begun in 1892, to be completed about 1940. The nearest approach we have to the great cathedrals of Europe. Length, 520 feet; width, 288 feet; height of central tower, 425 feet. Preparation of granite, limestone, and marble, and various building processes may be observed here at any time.

38. St. Luke's Hospital: One of the largest and most complete hospitals in the city. In 1901 the number of patients treated was 2,918. 373 (12.8 per cent) of these died, and the others were dismissed cured, improved, or unimproved. The average number of patients in the hospital was 248. There were 4,972 out-patients treated during the year. The total expense was $198,376. The training school for nurses has about 90 members constantly. During the year there were 2,054 applications for admission to the training school, of which 124 were accepted.

39. Water Works Station: A gate-house, controlling the distribution of city water in the district south of 93d street. Three 48-inch mains convey water into the station for distribution.

40. BLOCKHOUSE: One of the line of defenses for New York City in the War of 1812; known as "Barrier Gate," Manhattanville.

41. POLICE HEADQUARTERS: The Central Station for the thirty-first police precinct; one of eighty-two in the city. The force for this precinct has 170 patrolmen under the command of a police captain. The force is organized in four sections, each having a sergeant and a roundsman.

42. DYEING WORKS: Dyeing in various colors is constantly in progress. Open by appointment for class observation.

43. HANCOCK PLACE: A small square, enclosed by an iron fence, on which stands a bronze bust of Hancock. Similar in some ways to the public squares of early American towns.

44. ELEVENTH MUNICIPAL DISTRICT COURT: A court for the trial of petty civil cases is constantly in session. A city marshal's office is connected with the court.

45. BOTTLING WORKS: Bottling of carbonated drinks may be observed at any time. Has capacity for 160,000 bottles a day.

46. BREWERY: The process of cleaning and sterilizing bottles and of bottling beer may be utilized to illustrate similar processes connected with dairying. The stables for the large number of horses used in the business are in many respects similar to those found on a dairy farm.

47. CAR HOUSE: A storage house for a large number of the cars of the electric roads, having a large machine shop in the basement. The many switches at this point illustrate this feature of railroad construction.

48. METROPOLITAN EXPRESS COMPANY'S STATION: A large amount of express matter is here received, transferred, and reshipped, much as is done at a railway station.

49. RUDE HUTS: These huts are about as rude as the miners' cabins of California or the makeshift shanties of lumber camps. They may well illustrate some of the conditions of primitive life.

50. HOUSE OF ALEXANDER HAMILTON: Type of a suburban home of a century ago, having interesting historical associations. Now used for a private school.

51. HAMILTON GRANGE: The original site of Alexander Hamilton's home. There still stand several of the thirteen trees planted by Hamilton to commemorate the thirteen original states.

52. STATUE OF WASHINGTON AND LAFAYETTE: A fine bronze group in memory of these two Revolutionary heroes.

53. THE POINT OF ROCKS: The station from which Washington directed the Battle of Harlem Heights.

54. STONE QUARRY: Large excavations are being made in the solid rock of a considerable hillside.

55. ROUGH WOODED LAND: Very similar in character to the wind-swept tops of low mountains and to the timber line of some higher ranges.

5. Illustrative Material

The material included in the following list is available for use in the class work of the Speyer School. Most of it may be taken to the school and kept a reasonable length of time, though some of it, for various reasons, must remain in place and may be utilized for observation only.

At the Speyer School

Nature-Study: Specimens of coral, starfish, shells, crabs, insects, grains, nests, seeds, cocoons.

Indian Life: Canoe, moccasins.

Geography: Six small globes, one large globe, relief map of New York and vicinity, set of wall-maps, sand-boxes.

Home-Life: Doll's house; brooms; dusters; kitchen equipment; bath room.

Arithmetic: Scale and weights, two sets Speer blocks, dry measures, liquid measures, yard-sticks, foot-rules.

Many small pictures covering a large range of topics,

At Teachers College

Educational Museum:

Photographs and Prints: Several hundred pictures covering the following subjects — pottery and basket-making, Indian life, Eskimo life, fishing and hunting, weaving, early Greek life, Athenian culture, Roman life, classical mythology, chivalry, feudalism and the crusades, Columbus and early America, American trees, fruits and vegetables, cotton culture, wool industry, manufacturing industries, Longfellow's poetry, Millet's paintings.

Lantern-Slides: Several hundred slides on the following subjects — classical mythology, primitive life, Greek and Roman culture, architecture, painting.

Wood Carvings: A collection of wood carvings illustrating Chinese life and culture.

Department of Domestic Art:

Basketry: Specimens of rattan, splint, raffia, and cane baskets in various stages of completion.

Weaving: Large hand-loom for continuous weaving; series of small looms made by children; eighteen simple hand-looms for continuous weaving; specimens of handweaving by the Navajo Indians, by natives of Bulgaria, and by students in English trades-schools.

Spinning: Two wool-spinning wheels; two flax wheels; three old reels; collection of a variety of fibres; material arranged to illustrate the

complete process of manufacturing cotton thread; similar material illustrating the culture and manufacture of silk; material illustrating the manufacture of hemp, flax, and wool.

NEEDLE-WORK: Specimens of children's needle-work in American, English, and Japanese schools; specimens of Chinese and Japanese embroidery; Russian lace-work.

POTTERY: Specimens of Indian pottery.

Department of Domestic Science:

NATURAL FOOD MATERIALS: Specimens of unthreshed grains; varieties of wheat, oats, rye, barley, rice, beans, buckwheat, herbs, spices, tea, coffee, cocoa-beans, nuts, and mushrooms.

MANUFACTURED FOOD PRODUCTS: Italian pastes, flour, breakfast foods, starches, coffee substitutes, cocoa-bean products, baking-powders, sugar, and salt.

KITCHEN EQUIPMENT: Coal and gas stoves and ranges; varieties of coal; kitchen utensils.

Department of Geography:

LANTERN-SLIDES AND PHOTOGRAPHS: A considerable collection of views illustrating land formation and the life-side of geography.

MAPS: Relief maps of New York, Chattanooga, and other special districts; detail maps of the United States; climate maps.

Department of Manual Training:

WOOD-WORK: Models of joinery work and carving; specimens of polished and unpolished woods.

CLAY MODELING: Large variety of forms modeled in clay by pupils of the Horace Mann Schools and by students of Teachers College.

WEAVING: Specimens of pupils' work in simple weaving and in various kinds of basketry.

Numerous series of objects made by pupils in the elementary schools of England, Japan, Sweden, and other countries.

Department of Mathematics:

Set of geometric forms; series of computation blocks; two sets of Speer blocks; variety of apparatus for making physical measurements.

Department of Fine Arts:

Individual sets of type solids; large type solids; twenty-five casts of animals; collection of framed and unframed pictures; collection of Japanese books and prints.

Kindergarten Department:

PICTURES AND CASTS: Variety of photographs and prints illustrating commoner trades, animal life, farm-life, and family relations; plaster casts of wild and domestic animals.

NATURAL OBJECTS: Bird-nests; shells; minerals; a collection of other nature specimens.

EQUIPMENTS FOR VARIOUS CRAFTS: Shoemaker's outfit; samples illustrating the spinning of wool; crude material illustrating many common industries.

COLOR WHEEL: Apparatus for mixing colors by rotation.

AT COLUMBIA COLLEGE

Museum of Chemistry (Havemeyer Hall):

Specimens of the elements and their most important compounds; materials and products illustrating the chemical arts; numerous pictures, models, and diagrams.

Museum of Geology (Schermerhorn Hall):

Specimens of rocks, ores, and fossils of great variety; relief maps and models exhibiting the materials and forms of the earth's crust.

Museum of Mineralogy (Schermerhorn Hall):

Thirty thousands labelled specimens, including ores, building materials, minerals used in chemical industries, artificial minerals, and New York City minerals; 1,200 sections of minerals and rocks; 1,500 crystal models in wood and glass.

Museum of Biology (Schermerhorn Hall):

Large series of marine types; a variety of living animals and plants in fresh-water and marine aquaria; a limited number of prepared specimens of animal and plant forms.

[The University depends largely upon the American Museum of Natural History (Central Park at 77th Street) and the Museum of the New York Botanical Garden (Bronx Park) for illustrative material in biology. These museums are open, for observation, to the pupils of the Speyer School.]

IV. CONTROLLING IDEAS IN THE SCHOOL

By F. M. McMURRY, with assistance of Dr. T. D. WOOD
in part relating to health

The aims of a school are mainly the qualities of character desired in it, and any school naturally possesses a large number of them. But there are always some qualities that are especially valued, and these necessarily take the rank of controlling purposes.

Since a school is a miniature community preparing for life in the larger community called society, the aims of a school should correspond with those of society. At least the principal objects of the two should be the same and possess much the same relative worth. Therefore, we can determine the chief objects of a common school and obtain a fair idea of their relative worth by finding the leading requirements of social life and their rank.

The average adult has discovered that health is the prime requisite for efficiency, his daily neglect of this fact in practice serving only to impress its truth all the more forcibly upon his mind. In the best regulated families, therefore, the physical requirements of the children receive first attention. Even obedience is not required and desirable punishments are not inflicted, in the case of very frail children, until the body has been properly strengthened. If this practice is on the whole correct, the subordination of scholarship to health is evident. Some one has well said that a ton of knowledge — and, we might add, two tons of technical skill — if purchased at the expense of an ounce of health, is purchased at too dear a price. Health is the cornerstone, the foundation, of all education; — not an end in itself, to be sure, either from the biological or the economic point of view, but the essential condition of the important ends of life.

The Speyer School desires to treat health as the matter of first importance to it. Furthermore, it recognizes a duty in this direction not only to the pupils, but to the pupils' parents as well.

Indeed, a common school at the present time should aim to be a distributing centre of good for both children and grown people, and recognize important obligations to the latter even independently of the former. This may be overtaxing the school, but, so long as that institution *can* help the home in some of its duties, and accomplish some things that otherwise would be left undone, it should do so. This is all the more feasible since it has been found that the general efficiency of schools undertaking such work has been increased rather than impaired thereby.

To suggest more in detail the scope of hygiene in education, and in the Speyer School in particular, where the work of the free school and that of the social settlement are to be combined, attention is called to the following points:

In the first place, the school is expected to provide for a careful biologic examination of each pupil. It includes methods of anthropometry, physical and medical diagnosis, and family history. It also includes tests of the special sense organs, of fatigue and of motor ability in coördination. The school physicians in New York at present examine school children for evidences of contagious, infectious and parasitic diseases so as to prevent the spread of these conditions. But the larger biologic examination of a school should include much more than this;—everything in the physical, the organic and nervous condition of the child which has to do with his present health, with his organic and human capacity.

In the second place, the school should study the home environment and habits of the child with reference to the mechanical surroundings in the home. It should instruct the parents so that the home may provide, so far as it can, for the proper clothing, for proper food, shelter, eating, drinking, sleeping, bathing, care of the teeth, and for the medical attention which the child needs, even when those conditions which demand attention are first discovered in the school.

But when the parents can be persuaded to do but little in this direction, either on account of bad will or financial stress, the school should come to the assistance of the child, even though additional expense is thereby incurred. For example, it is frequently necessary that the school authorities take children to the clinics for treatment of the eyes, or for the removal of enlarged tonsils and adenoids.

The school here is the organized agent of society at large, of the State, — and from an economic standpoint it will pay society to have disease and deformity prevented, to have physical hindrances to proper growth and development removed, to have the proper medical attention provided, and even to furnish necessary food and clothing at public expense. Children cannot be pauperized in this way if this is done skilfully, and only *after* the home has done all that it can be persuaded to do.

Thirdly, the school should provide, in addition to a hygienic and beautiful environment in its building, a gymnasium for play and other exercise, and shower-baths, so that the children may have those forms of bodily activity of a general and special character necessary to the improvement of health and to the best general development of the body and its organs and faculties.

In any school it is necessary that the instructors in this field be as intelligent, broadly trained and rationally sympathetic as those in other fields of study. They should also have the intelligent sympathy and coöperation of all the other teachers and of the parents of the children, for proper work is peculiarly difficult here.

To these ends a gymnasium should be provided with all the apparatus and facilities which are useful, just as text-books are abundantly provided in other departments; and a reasonable period of time should be set aside in the daily program for bodily exercise and the bath. These requirements are already met to some extent in this school; but it is expected that much further progress in their direction will be made in the near future.

Also, correlation between the exercises of the gymnasium and the playground with the instruction and methods of other departments is recognized as a matter of much importance.

The exercises taught should include plays and games, exercises for the development of the special senses, and for the various mental faculties. There should also be certain exercises intended to counteract, to act as an antidote to, those postures and movements in the daily life of the child in the school or elsewhere which tend to an unhygienic position or condition of the body. It is of social value that these exercises, so far as possible, be given in groups; but all of this work should be judged by its effect upon the individual child, and there will always be children who need individual treatment.

Indeed, the requirements of individuality are more pressing in this field than elsewhere, simply because good health is the most fundamental factor in early education. Accordingly, any approximation to the ideal requires that there be space enough, apparatus and instructors enough to meet the needs of each child. Also attention to physical health should extend beyond the gymnasium to all the activities of the school-room, just as attention to good English is important in all recitations. Of course, this is an ideal to be reached in the future; still, it is an ideal in this school.

A fourth very important factor in the hygiene of education is the instruction of children of various ages upon matters relating to their own physical well-being. Although there has been much discussion as to the manner in which this should be carried on, wholesome hygienic instruction is for the most part still wanting. Frequently a certain amount of dry physiology and anatomy takes the place of the vital and interesting work which should be given. Or the teacher gives the children something of temperance instruction required by law, — a kind of work still more to be deprecated. All of the teaching of hygiene and health up to the seventh and eighth grades of this school will be kept quite apart from anatomy and physiology as such, and related to the immediate problems and needs of the children so far as possible.

Moreover, in the first half-dozen grades hygiene is not to be taught as a special subject or with text-books. It is to be presented through practical precept and suggestion, and, as far as possible, in the interesting and practical applications of various principles and facts in the work of the school wherever they have a natural bearing upon health. Such opportunities occur in almost all subjects, frequently in geography and history, and very often in the study of occupations and in nature study.

But mere class-work is quite insufficient in this kind of instruction. Most facts relating to health should be given to the children or parents individually, and in response to some definite need that arises. The children should be taught such matters in proportion to their maturity, care being taken that each child meet intelligently those health problems that arise in his own life and for whose solution he is responsible.

Again, the child should be taught health and not disease. If the proper ideals of soundness and efficiency are presented to

him in a skillful manner, he is much more likely to avoid disaster than when the horrors of certain vices are pictured.

For all of this work in hygiene it is most important not only that there be a school physician and a gymnasium instructor, but also that all of the teachers in the school be examples of that which is healthy and wholesome; that they be thoroughly instructed in matters relating to health and hygiene in their various phases and apply this knowledge to themselves; that they have the fullest conviction with reference to the importance of health as the fundamental factor in education; and that in their devotion to this ideal they be willing to sacrifice other requirements to it when there is a seeming conflict of duties.

The preceding statements about health apply, of course, to the kindergarten and the grades alike, as do the other statements that follow. In fact there is no reason for separating these two in any discussion of the controlling ideas in education. Accordingly they are considered together throughout this number of the RECORD, no more difference being recognized between a good kindergarten and a good primary school than between primary and grammar grades.

A second controlling idea in the school is that a good education combines learning with "doing." The largest occupations in life are farming and housekeeping, in which the relative amount of time spent in reflection, apart from action, is very small. Yet these industries are typical of the relationship between thinking and doing in general. Teachers are easily misled in their conception of the nature of life by the fact that their own vocation is exceptional, requiring a relatively large amount of pure study. Educators in general need to recall that, according to the theory of evolution, life consists of the activity of adaptation to environment, and that the purpose of the highest intelligence is the fullest possible adaptation. In other words, the function of the human being is to *act*, life culminates in action, and both knowledge and mental power hold the subordinate rank of means to an end. Any system of education that plans solely or mainly for acquisition of knowledge and for mental discipline omits, therefore, half of what is necessary for a good education. And when the fact is recalled that the application of theory is as a rule far more difficult than insight into it, it is evident what a very meagre preparation for life that school affords which

concerns itself chiefly with the intellect, or even with the intellect and the emotions. The principle here under discussion applies to all stages of education and, if these thoughts are really sound, the business man who questions the value of a college education as a preparation for business is not wholly right, to be sure, but fully half right. The average high-school and college courses, as they exist to-day, bear only a tangential relation to the requirements of successful living. They suggest that our people are still disciples of the old Greek philosophers who found the goal of human existence in pure reflection, in contemplation, in the intellect rather than in the accomplishment of deeds. No wonder that many of our best business men revolt at such education and prefer the training that business itself can give. The inadequacy, in fact the injurious effects, of much of the present education would be all the more glaring were it not for the corrective influence of the street and home life, of school life outside of recitation periods, and of the business atmosphere about us.

The nature of children also suggests that the end-point of a good education, at least in the kindergarten and the elementary school, should be action. Observation of children under school age shows activity of body to be a remarkably prominent characteristic. They are undergoing an education as truly, and certainly as rapidly, as the college student, yet almost no time is set aside for mental work apart from constructive work. No wonder then that the normal child objects to the primary school, as one did recently, by the remark that she did not like school because she did not like "to sit around so much of the time." In general, therefore, school work is too theoretical so long as an abundant outlet in action is not provided.

There is no pretense in the Speyer School that this outlet has been adequately discovered, but it is a fact that this conception of education prevails in the school, and efforts are being put forth to solve this problem more satisfactorily.

The imperative need of these efforts is seen most clearly in the importance of the particular ends to be attained through a fuller application of knowledge. Definite knowledge, good judgment, and administrative power or efficiency in general, are all at stake.

The application of facts to actual affairs puts them into

concrete form, exposing misconceptions and hypocrisies. It is, therefore, one of the very best means of testing and clarifying knowledge. That is an acknowledged fact.

But the corrective influence of such application on judgment is even more important. By good judgment is meant a proper appreciation of relative values, and, no doubt, theoretical instruction can do much towards developing this appreciation; it can lead to the rejection of minor matters as relatively unimportant, and to a recognition of the larger ones as larger, thus throwing constant emphasis on proper perspective. But before judgment in any field can become properly balanced and sharp, it requires the shock of the misfit between what one has thought to be true and what one finds to be fact, between theories and actual situations. Children experience these shocks daily when they conceive ways of making things, and run against unexpected difficulties. They often cry over their troubles, but such misfortunes are the disguised blessings that people jest about. If teachers could agree that the development of good judgment in various fields constituted one of the most important objects of instruction — far more valuable than the mere acquisition of knowledge — and that the building of air-castles was a very meagre help in this direction, they might set to work more earnestly to bring pupils into contact with actual affairs through action.

The extent to which initiative in action is wanting, involving self-direction, leadership and administrative ability, is too little appreciated. Our great industrial leaders, together with the industrial and commercial supremacy of the United States over other countries, blind us to the average defects in this respect. But think of the number of fairly well educated persons who do not know what steps to take to "find a job"; who do not know, and cannot find out, what men should be interviewed; who cannot meet men, and cannot present their case with effectiveness. One reason why the servant question is so difficult of solution is that the average mother of a family employing help does not know how to manage a servant. Innumerable maids are being spoiled by kind-hearted women, who are utterly wanting in executive ability. If further examples of administrative incapacity are wanted, recall the average meeting of teachers, whether county, state or national. What probability is there that the subject an-

nounced in the program will be pointedly discussed or even discussed at all? That the speaker will stop when his time is up? Or that the chairman will properly guide any open discussion? We have arrived at the point where we need to define once more what is meant by education. Is it something primarily intellectual? Or is a man, who is a good student in the ordinary sense, still badly educated unless he is a man of action to a fair degree, unless he can accomplish purposes, unless he possesses fair power of self-direction and of direction of others? In other words, is a man uneducated until a reasonable degree of efficiency has been developed in him?

As has been stated, this is a question for all stages of education. Under the influence of the principle of apperception we have long been laboring to find more suitable *beginnings* in the learners' experience for the various topics of instruction. This is especially true in the kindergarten and the elementary school, where, more and more, starting-points are being found in motor activity, although all sorts of native tendencies and related experiences in the way of knowledge are being utilized as a basis. No doubt, need of such effort will be likewise recognized in higher work, as the years pass.

But topics of instruction that are thus well begun may still *end* in nothing more than theoretical knowledge, and this is especially true wherever, as in the high school and the college, subjects are taught as sciences. Does not teaching a subject "as a science" imply that that body of thought shall be presented mainly without reference to human relationship? Does it not furnish the instructor, then, an excuse for ignoring the learner's interest and motive for the sake of a system of thought? Yet motive for hard work is certainly lacking in the high school and college, on the whole, as in the grades, and one's point of view when he plans to teach a science "as a science" does not tend to correct the evil. In fact, it tends exactly in the opposite direction.

Grade work suffers from this point of view much the same as the high school, although the word science is less often heard there. In the case of each study, the elementary school presents the body of thought first and lets application to life follow; if either portion of the work is slighted, it is the latter, and, in fact, the latter is largely omitted. Would it not be practicable in all

stages of instruction, and particularly with children, to commence more often at the other end, namely with the real problems of daily life, thus first establishing a need of knowledge? Then the facts presented would be less theoretical from the start. For instance, while it is common in physics in the high school to study pulleys and other machines first as theoretical knowledge, then after the principles of machines are developed, to find some applications in life, it would not be difficult to reverse the order. We might set out to learn how the immense steel-beams are lifted to their places in many of the large buildings in this city. Actual observation, and possibly an excursion to some of these buildings, might be the starting-point. If this part of the work were done properly a greater spirit of reality would be given to the topic through the students' contact with actual affairs. The instruction that followed might be just as thorough as by the other plan, so that there need be no objection from that side. But close relation of the topic to life is thus made sure, and if any portion of the work is neglected it is some of the systematic part, of the theoretical part, of the part that can best afford to go.

The same idea applied to the kindergarten and the grades might lead us in fine art to set out to furnish and decorate a flat so as to make it attractive. In reading or literature it might cause us to practice oral reading in order to read acceptably to members of the family at home, to blind or old people in the neighborhood, or to others needing such attention; or it might lead pupils to practice telling stories well in order to tell them to such people. In arithmetic, if typically accurate data were furnished, children might figure to determine whether or not a farmer in Illinois makes more money by selling his corn outright, than by fattening cattle, or hogs with it. In domestic art it would suggest that a class plan to sweep and dust an apartment satisfactorily. In all such cases concrete problems would hold the attention from the beginning. If their solution involved knowledge only, as in the case of arithmetic, it would at least be knowledge whose direct relation to life was evident. And if the solution involved action also, as in the actual decoration or care of some rooms, there would be mental work in the way of the acquisition of preparatory knowledge and of planning, and then there would be the execution of plans, calling for growth in judgment and executive ability, as previously discussed. There

is no doubt but that the common school is seriously suffering for want of such an outlet in action, including execution of plans, service to others, etc., and there is also no doubt but that the needs here and there in the community, which young people might be meeting, are innumerable. One educational problem of the future is to locate these needs definitely and to devise ways of setting children to work to satisfy them. With progress in this direction the time may come when the question, What do you know? — so common in the elementary school — will have given place to this other, What can you do? At any rate, the authorities of the Speyer School believe heartily that that time should come, and desire to take what steps they can to bring it about.

The development of tastes, or of permanent interests, is a third controlling aim of the school. This is not merely because interest is the condition under which knowledge will catch and hold the attention, be reviewed, digested and remembered, — very important matters, to be sure, — but also because interest is the source of energy. From the biologic point of view one purpose of excitement or anger is increased ability to escape danger or to offer resistance; and in human beings emotion has a similar purpose — it gives force, strength, energy, to accomplish ends.

Interest is another name for feeling or emotion, and the direction and degree of one's interests determine the directions in which he promises to be active, as well as the degree of energy to be manifested. On these accounts the development of affections along right lines becomes a great object of instruction. Deep interest, in the field of education, is what "power" is in the industrial world. A manufacturer may be abundantly supplied with raw materials and possess very powerful machines, but all is useless until the power is applied that can set the wheels in motion. So a person may have stored up a great quantity of knowledge and have developed an unusually strong mind; but until motive power is applied, which is found in interest, work is not done, results are not reached. From this point of view the many college graduates who are distinguished by no enthusiasms, whose admired mental balance consists only of an equal indifference toward all great fields of effort, lack one of the very rudiments of a good education.

Each recitation and each study may, therefore, be well regarded as an instrument for stimulating, for arousing deep in-

terest, and even the relative value of studies, in spite of Herbert Spencer, may depend as much upon their power to excite permanent affection for something, as upon the mental discipline or the useful knowledge they may furnish. Also, just as cooking more nearly than arithmetic may be a norm of what a study should be, since it combines theory about equally with practice, while arithmetic lacks the active, "doing" side, so studies hitherto largely neglected may take high rank if this conception of the value of emotion holds good. At least, music, and the study of form, color and classic pictures might take rank with literature, a rank which those interested in the Speyer School are inclined to give them.

In this connection it is well to call attention to the social interest in particular as one kind that is especially worthy of attention. Many of our worst politicians are extremely sympathetic souls, having an unusual number of close friends for whom they make innumerable sacrifices. But the welfare of the mass of humanity is beyond their habit of thought, and they are deaf to its appeals. In other words, a sympathy for the thousands and millions of human beings about us, most of whom we can never know individually, is a very different thing from a warm sympathy for this and that close friend, or poor sufferer whom we may happen to run across. Since no great effort has been usually put forth for the cultivation of this latter, i. e., the social interest, through the schools, not a great amount of it has yet come into existence, and the results are clearly shown at the polls and elsewhere. But the Bible has stood for this interest for ages, and all the instrumentalities of the school should now be more actively utilized in favor of goodness toward society, in distinction from goodness toward certain individuals.

The studies and the form of government of the school can prove great helps in this direction, but it is well to keep in mind that until two other reforms have been effected, proper results are not likely to be reached. Namely, in the first place, teachers as a class must identify themselves more directly with social matters; they must read the papers, become excited about public issues, have convictions on public policy and stand by them actively. One of the greatest objections to women as the sole teachers of youth in our public schools is the fact that they care so little for public affairs. In the second place, teachers must approach judicious

settlement workers in spirit; they must make the school a center of uplift for the surrounding community, and so live before their pupils that the latter will grow up in an atmosphere of mutual service. But, it must be confessed, this can never happen until the informational side of the teacher's work becomes relatively less prominent and she plans rather "to live with her children" than merely to teach them facts. As suggested once before, the very function of the school in the community is here involved; but the history of the kindergarten suggests some of the possibilities.

A fourth quality of character should be named as especially desired in the Speyer School, namely a tolerant, open mind. Children are inclined toward dogmatism as well as adults, and it is their impatience with one another's statements and acts that causes a large share of their disputes and quarrels. If from the beginning they could be influenced to feel reasonably sure that they are right, but not too sure; if they could gradually be led to hold their views tentatively and thus approach the scientific attitude toward them, they not only might avoid a great amount of trouble in childhood, but as adults they would make fairer-minded citizens capable of progress. Our political and religious life is suffering wretchedly from a lack of this quality. Probably the personal manner of the teacher is the greatest factor in the school for incalculating it, because of the marked tendency of children toward imitation. But other means should also be relied upon, as the habit of discussion in class, through which one becomes accustomed to oppose and be opposed without anger, and comes to realize that one mind alone usually overlooks many important considerations relative to any given topic. Besides this, a method of teaching should be adopted that makes the pupil conscious of many unsolved problems in the subjects covered, although many other problems have come to be well comprehended. One important purpose of good instruction is to develop a sense of need of further study, to create an appetite for more.

It is clear from the above that it is the desire of the teachers in the Speyer School to make the impression upon the children that there are several matters, even besides health, that are probably as necessary to successful living as knowledge. This does not signify that as much of the school time will be given to each of the others as to knowledge, or that the three R's will be

neglected. On the contrary, enough time should be devoted to each study, as Beginning Reading, Arithmetic, Writing and Spelling, to master them reasonably well. But when requirements of health conflict with those of instruction, the former must have right of way; and both the daily habits and the statements of the teachers should emphasize the fact that sound judgment, ability to execute plans, habits of service, energy, and a tolerant spirit count, each, for as much, and often much more than mere scholarship. More than that, a good portion of the time at school, as in general exercises, in various recitation periods and during intermissions, may well be spent in establishing this conviction. Sociability and tact might, perhaps, be added to the very desirable characteristics mentioned, but it is not wise to carry the enumeration further.

Enough has been said to indicate that it is the desire in the Speyer School to deviate from custom to the extent of giving about the same relative value to qualities of character in the school as is given to them in society at large. Too many middle-aged persons of the present had to spend years, after leaving school, in correcting notions of relative values received there, before they found themselves in harmony with social requirements and social ideals. Such corrective process is very expensive and quite unnecessary. For instance, thoroughness, promptness, regularity, economy, and quickness are not virtues that are invariably to be practiced, they are not absolute, but merely relative merits. Hence, one should be taught to be thorough, provided, in a given case, there is not something more important than thoroughness. How many teachers to-day cannot enjoy literature because of the old notion that they must look up each new word in the dictionary, must understand each construction and the meaning of each sentence! Again, how many are wasting time reading every word in each book that they read at all, under the impression that they must be "thorough," even though they find the substance of whole chapters already familiar to them! Such conscientiousness is a direct barrier to progress. One of the most important duties of the school is to develop the habit of mind, among pupils, of comparing values and of choosing what is most important, without suffering later from a guilty conscience because minor rules of conduct seem to have been violated.

V. CONTROLLING IDEAS IN CURRICULUM OF KINDERGARTEN AND ELEMENTARY SCHOOL

By F. M. McMURRY, with assistance of C. H. FARNSWORTH and Dr. T. D. WOOD, in the parts on Music and Physical Education respectively

The preceding discussion suggests the outlines of the curriculum desired. The two most prominent controlling ideas in the selection of studies and of topics under them are the *requirements of society* (including, of course, its ideals as well as its present practices) and the *nature of children.* The former has been, possibly, the more important determining factor, although the latter follows it closely in influence. At any rate, when the two have come somewhat in conflict, as in the case of spelling as a study, the latter has yielded. In other words, children in the Speyer School learn to spell rather on account of the social demand for correct spelling than because their natures hunger for that kind of mental nourishment.

As a rule, however, these two factors work in harmony. The kindergarten, for example, accepts the lead of society in its demand for habits of cheerful coöperation, politeness, kindness, obedience and orderliness, but the nature of the child responds readily to these requirements.

There is the same reason for aiming at these qualities in the grades and the same tendency on the part of the children to respond. But the elementary school, on the whole, is a less intelligent, less faithful, servant to society than the kindergarten, as is indicated by the fact that, while these same very important habits are nominally aimed at in the grades, in reality they devote very little time to their development. The difficulty is that the common school, unlike the kindergarten, is not fully in earnest in searching for what will most help the child to effective living and, then, in introducing that subject matter into the curriculum. The course of study is to a large degree an inherited misfit from the past, supported by a crude conception of utility, an outworn

psychology, and a blind optimism. The controlling aim, as a rule, has been preparation for a distant future time; that is, storage of matter that will prove valuable later, rather than now. In arithmetic, for example, there is little pretense of meeting, each year, the actual quantitative needs of that year; anticipated adult wants are the guide, instead. Yet, in spite of that fact, there is no doubt but that fully a third of what is ordinarily taught in this subject, like Troy and Apothecaries' Weights, Greatest Common Divisor, Compound Interest, etc., will not be called for in adult life. The next excuse for retaining such topics is that they, at least, furnish good mental discipline. When, in reply, it is shown that mere mental exercise, as such, has little value, the faith still remains unshaken, that "somehow great good must result" from such work. Thus, the common school curriculum is allowed to remain peculiarly theoretical; it largely ignores the child's environment, instead of leading him into it and actively identifying him with it.

The first reform needed is a changed attitude on the part of the teacher toward present time; the first function of the school is to meet present wants, to provide for the richest possible present life; thereby it will most fully prepare for more distant time.

The next thing is to investigate what is going on about the school, for the purpose of finding live topics that may become a part of the regular curriculum.

Not only will the relation of the school to society be thus made more direct, but the child's interest may also be appealed to more forcibly. When the topics of instruction are isolated from social life the child is left with little motive for hard work, at the very time, too, when he is expected to do such work. But when the prominent topics of conversation in school and in society become one, he feels motive for effort owing to consciousness of this relationship.

These statements explain our reason for searching for a different curriculum from the usual one. Our leading line of work for the first two years is the Observation and Reproduction of Surrounding Occupations; then follow Primitive Life and History. There is a double justification for this first study, one being the desire, already explained, to identify the child with social life, the other to obtain a safe basis for the comprehension and appreciation of distant and imaginary events, objects, etc.

Most newly proposed curricula seem to us to fail in this latter respect, especially during the first year or two; they set the children to work on distant environments before building up a sufficient knowledge of their own. Possibly the Culture Epochs idea is a partial reason.

The nature of the children calls for a more active reproduction of surrounding occupations and of primitive habits than words alone allow; consequently materials of various sorts are continually used for that purpose, as blocks in abundance, clay, paper, color, cloth, etc. These not only produce especially clear mental pictures, but afford opportunity for the development of power to execute plans and of habits of coöperation with others.

The kind of employment next in lead, in the minds of the teachers, is Manual Work. While there is much construction in the preceding study, as just indicated, it is only the very easy construction that is admitted there; the kind that can take place so rapidly that the flow of thought in the subject is not seriously checked. Materials involving much resistance and, therefore, requiring much time for the making of an object, are confined to the manual work periods. The manual work is of several kinds, including wood work, cooking, sewing, decoration, care of a house, etc. The Primitive Life also includes much comparison of ancient with modern methods of work, and calls for much use of materials. In fact the materials to be used in the grades is a question of increasing importance, as the aims of the school and the nature of children are better interpreted. Possibly the time will soon come when teachers in the elementary school will think first of wood, clay, sand, etc., rather than of text-books, when it is asked what the children shall work with. In that case we shall be following the lead of the kindergarten, as in so many other respects.

Owing to the nature of children, we are inclined to omit writing and arithmetic as separate subjects during the first year of school. At any rate we desire to make writing less prominent than is customary in that year and confine it mainly to board work, where very large movements are allowed. Arithmetic is an incidental subject the first year, and we may neglect it somewhat, as a separate subject, the second year. It should be remembered, however, that the abundant use of various kinds of materials, including blocks of definite sizes for building, etc.,

naturally calls for a large amount of measurement, and promises to result in much the same arithmetical knowledge as is ordinarily aimed at in the first year, although it will be less systematized.

Is it not high time that those interested in the elementary school agree as to what shall be left out, and make the list a very large one? No wonder that our course of study is greatly congested when we have doubled the number of studies in the last generation, without agreeing on many omissions. It seems strange that we should be so radical in regard to introductions, and so conservative in regard to omissions. A more sharply defined aim of the school, such as social efficiency, would make it easy to leave out a great number of topics.

In order to avoid congestion further, some of the studies are made to alternate with others, by the half year. We believe that it is not advisable for children to pursue a very large number of subjects at a time, because the small number of periods per week that can then be allotted to each renders it difficult to keep up interest and avoid distraction.

At the present time it is impossible to state the exact amount of time assigned to each study. This is due to the fact that some of the regular teachers have charge of two grades, and, when students from Teachers College are giving instruction, a program must be arranged different from that followed at other times. Thirty minutes per day, however, is always set aside for gymnasium exercises.

The recognition of a controlling spiritual Power is a prominent part of the kindergarten aim, being brought about through observation of power and beauty in nature, of examples of dependence in simpler human relations, and through such acts of gratitude and reverence as are suitable to children. The attitude of the grades towards religious instruction is less definite. We feel it to be our duty, however, to work toward the same end there and, aside from various general exercises. it is our intention the coming year to undertake some regular instruction in Bible Stories.

No one method of correlating the several branches of study has been followed. In the kindergarten the various kinds of work are based on the same thought through each day and week. In the first three years, under the influence of Dr. Dewey's valuable suggestions, human interests have been accepted as constituting

the main body of subject matter, and we have then differentiated this broad field into the several lines called studies. After that time the branches of knowledge grow gradually more independent of one another, although the effort is constant to interrelate them as far as really natural relations are discovered.

According to the preceding discussion of the controlling ideas in the school, music and health are subjects of special importance. They are also greatly neglected, as a rule. On these accounts, and because it was found that the heads of these two departments in Teachers Collegt were able, at this time, to give special attention to these subjects in their relation to the Speyer School, it was deemed wise to set aside an amount of space for them disproportionate to that given to the other studies.

Music

The term "school music," though it defines in a general way what is attempted in most schools, gives but a vague idea of what is done, for the study has not been considered a serious part of any curriculum, even where it has been admitted as a part of the school exercises, except in the most advanced schools or where the music teacher is a person of exceptional ability. To judge, therefore, of a course of music study, a discussion of the principles upon which it is based is necessary. This might not be so, were the lines along which the study should be conducted more generally agreed upon.

Music, an Art and a Science

Two important facts are kept in view in the following description of elementary music study. First, music is an art demanding a satisfaction of the emotional nature, and it is also a science dealing with the relationship of tones and appealing to the intellect.

Intangible Nature

Second, a peculiar difficulty in music is that what excites us, sound and movement, has no existence in space. Hence there can be no corroboration of a tonal sensation by an external entity, capable of being perceived through other senses. This

requires the teacher to see to it that the tonal relationships upon which much of his teaching depends, are really awakened in the consciousness of the pupil. The fact that the pupil can sing these relationships does not necessarily imply this consciousness. This is especially important in connection with the notation of music, which is a spacial or concrete representation of something that does not exist in space. Hence the great difficulty in music teaching, the loss of connection between the representation and that which is represented, between the symbol and the sound.

Effects of these Characteristics

Before giving the course of study it will be best to see what effect the two facts just mentioned have on the study. First, the fact that music is both an art and a science makes it necessary to keep the æsthetic and scientific ends clearly in mind. Artistic results are not obtained by scientific methods nor are scientific results obtained by artistic methods. These two methods, starting at the same center, work in opposite directions. To illustrate: the artistic treatment starts with a song or a complete musical passage, and every change in tone quality, breathing, enunciation, or expression is made with reference to a better production of this whole. The scientific treatment, starting with the same song or passage, breaks up the whole into its parts and classifies them under heads and sub-heads, such as intervals of duration and pitch. In the first, the whole is kept constantly in view, in the second, the parts.

1. With Reference to Choice of Music

What effect has this upon the subject matter? If a song is chosen to develop the artistic side of the child, it will be one representing variety. It will have rhythmic swing and effective tonal changes descriptive of the text. This will be especially necessary if the child's musical nature is dull. On the other hand, if the song is chosen to develop the power of musical analysis, essential for singing from notation, the song must be simple to the verge of boredom, to avoid overtaxing the child's undeveloped powers of concentration. In other words, the material that serves for developing the æsthetic side of music will

not serve for developing the analytic side. This dualism is most apparent at the beginning. To please the young listener the music must be full of life — dramatic. As his tastes develop, and his power of appreciation is increased he is better able to appreciate simpler music, noticing its beauty rather than its descriptive nature. On the other hand, the analytic work will be the very simplest at first, growing complex as the study progresses. Thus the difference which is extreme at first grows less each year, until the student can enjoy what he can read.

2. With Reference to Notation

We turn now to the second fact arising from the peculiarly elusive nature of music, making it difficult to keep the connection between the representation and that represented. Here the difficulties presented lie wholly in the analytic treatment of music. They would not exist if we learned music by ear or rote, as mankind has done for ages past. But as soon as we attempt to sing from notation this difficulty appears. It does not exist in the same degree for the instrumentalist, for he can make a connection between the written note and the mechanical means necessary for producing the tone called for. He has something external by which he can check or verify the tone desired. True, the musical player is not dependent on this; still it makes the teaching of instrumental music to non-musical students possible. On the other hand, one singing from notation must imagine, from the notation, the tonal effects before he can produce them. That is, something that does not exist spacially must be conceived of from its spacial representation. This requires first, that the musical fact or tonal relationship to be taught to the pupil shall exist as such in his consciousness. A child might sing a song presenting many definite relationships and not be conscious of one of them. The relationship to be taught must be individualized so that it is distinct in the mind; that is, from feeling a given passage as beautiful sound, the student turns to the individual tones that constitute it, and to their relationships to each other, as soft or loud, long or short, high or low; these distinctions must be so clear that they may serve as a basis for comparison and classification. Or a child might be taught a great many intervals of duration and pitch,

and not be able to make any connection between such intervals and their appearance in the songs he sings. Hence the importance of the requirement that the definite conception of a tonal relationship shall be from passages existing as music in the child's mind. Second, this relationship must be associated with its notation, so that when the notation is seen the tonal effect of the relationship can be imagined. Thirdly, from this conception the correct vocal effect must be produced.

Summary

The fact that music is both artistic and scientific as well as elusive greatly influences the study of the subject matter and its presentation. In the first place, music used for developing artistic qualities is not adapted for the analytic work required for the scientific treatment; second, the analytic process must commence with what the student clearly recognizes in his consciousness as distinct, and at the same time as a part of what is felt as music. Then must be learned its representation in notation and the power of reproduction from this notation.

The Two Parts of Music Study

A course of music planned along lines discussed above will naturally fall into two distinct divisions. The first treats of the song as a whole, or music as an art. The sentiment of the words, the breathing, articulation, tone quality and color, and those means of expression that give unity and effectiveness to the song, all tend towards this end, and are directly employed for æsthetic purposes. The second division, or music as a science, breaks the song up into its parts. Pulses, rhythms and interval groups are analyzed and classified. These parts are individualized, made distinct from each other. A knowledge of form and structure is given, perceived by both ear and eye, the analytic method being followed. This is the opposite of the plan followed for getting direct æsthetic results. The analytic process is made difficult owing to what has already been mentioned as the intangible nature of sound, making it hard to symbolize. It is obvious that the power to read music increases the possibility of æsthetic pleasure, but this is not all. The analytic work necessary

in order to learn to use the symbols of music so quickens the musical intelligence, that though the power to read music did not follow, still the study would be worth while for the increased ability it gives for æsthetic enjoyment through the quickening of the mind with reference to tone phenomena.

Though singing at sight or learning the notation of music is often considered the aim of school music, as the learning to read and write is the aim of language work, there is a fundamental difference between the two, and there are really other aims that are more important.

In the language work the child has already learned to express himself in speech, and he comes to school to learn the written and printed symbols of this speech. If, instead, he came with only the powers of expression of a child a year old the course of language study in the primary grades would be very different from what it now is. In such a case, before the symbols of the language were touched, the child's power of self-expression through speech would be developed. Learning the symbols of written speech is after all an incident in something much more important, which nature does for the language teacher before the child enters the Kindergarten. But this is still a superficial view, for the child does not merely learn the words of the language; he learns to think with them — the spoken word is the expression of this thought.

Nature of Æsthetic Work

The difference between the language teacher and the music teacher is this: the music teacher has to go much farther back; not merely the form of musical thought, but the musical thought itself becomes his most important work. This shows not only the importance of the æsthetic work, but also suggests its nature at the early stage. It will not even be so much the learning of the gems of musical literature as models, however important that may be, as the awakening of musical feeling and associating it with forms of musical expression. That is the important thing. The early attempts must be crude, like the child's first attempts at speech, but this crudeness is infinitely better than the mere learning of simple songs correctly by rote, without appreciation. Music is not merely a collection of beautiful

sound forms, it is a means of self-expression. This self-expression is the kernel of music teaching; unless the musical life commences from this seed, everything else will be artificial and false. As soon as self-expression has commenced, its improvement through imitation of models will follow. The aim of the æsthetic work at first will be to stimulate the child to self-expression. The songs used will be those that the child will appropriate to himself. The words of the songs will be either nonsense words, which the child as well as the savage seems to enjoy, or else those relating to the daily experiences of the child, his games, animals, phases of nature, and incidents and celebrations of home life, treated from the child's point of view, that of action rather than reflection. The melody must have a rhythmic swing capable of being interpreted by the words, and in turn interpreting the words; dramatic to a fault.

If the child's imagination is stimulated, the song will come to him as an expression of what he felt and wanted to express. Thus he will gradually appropriate forms of musical expression until he has a vocabulary, so to speak, for expressing musical feeling. He is then ready for the analytic work to commence, ***but not until then.*** After it has commenced, it should always follow and be based upon music treated æsthetically, for only under such conditions will there be any sense to the analytic process. The analytic work is only a means and not an end.

Practical Value

So far we have treated music for its own sake, but music can have a very practical value in school life. In fact this side is all that the average superintendent or teacher cares for. If well taught, music can do more to make school work pleasant, both for the time being and in retrospect, than all other school work put together. It unifies school life and refines the child. It is obvious that this practical side of music falls under the æsthetic treatment of the subject; it will have much to do with the choice of songs and their use. It will demand time aside from the pure study of music. A school has as legitimate a right to make a good appearance as the individual has to put on his best clothes. The school must always have some fresh exhibition music that can be depended upon for special occasions;

it is not for the purpose of showing the child's musical knowledge. It is for its own sake and for what it does in the school economy, and should be understood by all as such. Thus public school music serves two purposes: first, for the student; second, for the school as a whole, and indirectly for the individual student. These purposes are both directly served by the æsthetic treatment of music, and indirectly, by the analytic. But though the latter is indirect in its service, it is what gives shape, solidity and dignity to all the musical work.

It is obvious that the æsthetic treatment of music does not need that logical division into steps that the analytic requires; the very spirit of the æsthetic treatment demands that there be freedom, for its success depends upon the teacher's meeting the mood of the class, and utilizing it. The same set of songs cannot be equally appropriate to the same class at different times, much less to different classes. Hence what is given here as the plan for the Speyer School must be understood to be typical and illustrative only.

Dramatic Songs in Original Work

The first year, songs will tell a story in a dramatic way. The movement suggested by the words should be expressed in melody and accompaniment, in broad and characteristic style. In the second year there will be much of the bold and dramatic treatment of the first year; at the same time, songs with less striking character, depending more on the beauty of the music, can be given. The child's own powers of musical expression will be developed by attempts on his own part to put words together rhythmically, and make tunes to them. The child responds readily to this sort of work; the danger is that, instead of making up a tune that he can repeat, he will wander aimlessly. Such work, however pleasant, does not require enough thought and concentration to be of much value. To repeat an improvisation is excellent practice in concentration.

Change from Rote to Sight Singing

By the end of the second year the child should have a fair musical vocabulary. The common rhythms and cadences are

familiar, and, with the analysis that has been going on at the same time, the young musician will be ready to commence the serious study of note-reading. In the third year, as the reading capacity will not be equal to the æsthetic demands, much music will be introduced merely for practice in reading. The improvement and strengthening of musical interest will make it possible to introduce some music from the classical masters which will be simple enough to read, and, at the same time, not seem dry and uninteresting to budding æsthetic powers. A large part of the work will still consist of rote work, in order to increase, as far as possible, the musical experience of the child and to give opportunity for practice in articulation of words, tone formation and expressive singing. The fourth year will be a continuation of the third, the increased ability to read and the growth and refinement of musical taste making it less necessary to introduce music that cannot be read by the student; by the fifth year the rote singing will be limited to unusual passages here and there. The gap that existed the first year between the æsthetic demands and reading capacity will have disappeared, and through the rest of the grades the two should go together.

Play and Imagination

Under the æsthetic division of music study were included, beside the song work, breathing, articulation, tone quality and color. The rather unusual classification of these topics under this division is owing to the method of their study. Instead of considering these topics independently, as is usually done with mature students, the drill along these lines is always connected with the effort to make the song more beautiful. Such correlation is of the highest importance in cultivating the taste and intelligence of the student; even where breath and tone exercises are taken independently of the song, the method employed is still æsthetic, or along play lines. For instance, the position of the body for good breathing will be acquired indirectly through imitation of plays, such as being soldiers, driving horses; deep breathing will be obtained by sipping water and imitating a drum major; exhaling, by blowing feathers, seeds, or by blowing at the teacher, while he measures its length; again, by playing that the children are organ bellows, while the

teacher is the blower, imitating various kinds of wind. In the same way tone work will consist in expressing feeling through quality, or in the imitation of sounds. The sound must be alive, must go to all parts of the room, may say good morning or good-bye, may imitate the wind in telegraph wires; or it may imitate animals. So with the exercises necessary for good articulation, whirring, buzzing, rolling, hissing, humming, ticking, all are obtained through play and imitation work, always appealing to the imagination. The main work in breath, tone, articulation, etc., is done in connection with the beautiful rendering of the song. These independent exercises mentioned above are for special work in overcoming difficulties for which the songs may not give opportunity for sufficient concentrated practice, especially in the earlier grades. Their use depends on the needs of the individual class and cannot be apportioned to grades. Breath and tone work will naturally require more independent practice at first than later on in the course.

The Analytic or Scientific Treatment

In the scientific treatment of music the parts have a causal relationship, and only as they are unfolded with reference to this relationship has the course value.

Two underlying principles govern the method and material. First, to pass from the fundamental, that which is most obviously connected with the musical experience of the child, to the accessory and less obvious. Second, to define by means of motor expression, then pass to pictorial, and, finally, to symbolic representation. This assures definite consciousness of what is to be represented by a notation, and of the connection between the notation and that which it represents. The succeeding description of the course will illustrate how these ends are attained.

Physical Education

1. Physical Training

That part of physical education which has to do with the larger muscular activities of children may well be called physical training or gymnastics. This is both fundamental

and supplementary to the more specialized activities of school life. The movements of physical training are fundamental in so far as they provide for the development of the larger muscles and corresponding nerve centers, and through such exercise for a better condition of the body functions as a whole. They are supplementary in that, from a somewhat different standpoint, they add those larger body movements which are not required by the technical activities of the school or by practical every-day life, but which are necessary to the best state of health and the highest efficiency of the body. Physical training, then, should strive first for hygienic ends, i.e., to keep the body healthy and strong, and thus make it more effective. Second, the exercises of physical training should serve as an antidote to the tendencies in school life and elsewhere to improper postures and positions of the body. Third, physical training should serve a definite educational end by so developing the voluntary muscles and their controlling nerve centers that the nervous system as a whole will be well developed. A complete motor education is one of the most necessary factors in the training of the child. It is important that he be trained in as many different forms of activity as possible, for this tends to give him self-control, an improved will power, and at least certain kinds of courage. It also tends to give him greater facility in taking up new forms of activity as he grows older.

The practical exercises of the gymnasium should correspond, on the whole, to those forms of bodily activities through which our ancestors, — both human and those even more primitive than human beings, — have gained their development and have become strong for the struggle of life. For example, general body movements of the fish in swimming, of the monkeys in climbing, of primitive man in swimming, paddling, in some of the activities of war, and more particularly in the simple movements of agriculture, give important suggestions as to the kinds of movements that are useful in the normal, orderly and progressive bodily development of the child.

It will be necessary, in the gymnasium, to adapt the local conditions and the available forms of apparatus to these large, simple, vigorous body movements; and, as in other subjects of the curriculum, it is important to furnish effective motives to the child for these activities. To this latter end, games and other

forms of exercise which appeal to the play instinct should be resorted to as far as possible. In addition, as the pupil grows older, there should be a few more formal exercises, given to command, so that the child may learn obedience and quick response.

The basis of this work in physical training should always be individual, and it will be necessary in many instances to give to the child who is in any way atypical special forms of exercise, intended more directly to correct some tendency to deformity, or to counteract the over-emphasis that has been placed upon some power or faculty. It may be necessary to quicken the finer and more specialized neuro-muscular reactions of the backward or sluggish child, or to emphasize the larger and steadying movements and reactions of the child who is precocious and too sensitive.

It is important again, in order to increase the interest of both teacher and pupil, to further some of the more technical phases of instruction, and to establish unity in the school work, that there be, within reasonable limits, a correlation between the movements of the gymnasium and the activities involved in such subjects as music and manual training; to some extent, also, gymnastics may be correlated in thought with history, nature study, geography, etc.

The time allotted to physical training in the daily program of the Speyer School is as follows: for all grades one half hour in the gymnasium; a recess period of ten to fifteen minutes for recreation and spontaneous play; and another period of five to eight minutes for such gymnastic exercises as are possible in the schoolroom. These intervals are intended to be so arranged, as to alternate with recitation and study periods, and to break up the session as equally as possible. It is usually necessary, for two grades to use the gymnasium at once; therefore there will be four gymnastic periods, when the eight grades are completed. When the periods for gymnastics, recess and schoolroom movements are properly arranged, they will come at different times for each of the four groups of grades.

The exercises which can be given in the gymnasium will depend to a large extent upon the equipment that will be provided for the Speyer School building, and also upon the ability of the instructor who is employed for this purpose. The exer-

cises suggested have not been divided up specifically for the different grades, but are to be adapted to the local conditions and to the pupils.

In a general way the first and second grades should have many large body movements, with rhythmic dancing, accompanied by music and folk and imitative games; very few formal gymnastic movements need be used in these grades.

In the third and fourth grades the larger body movements should be continued, more especially those made possible by the gymnastic apparatus; — in addition, more difficult movements in rhythmic dancing should be given, and the folk games should be continued, placing more emphasis upon those which have a purposeful motive or end, and less upon the games which are imitative or simply imaginative.

In the fifth and sixth grades the exercises previously used should be continued with some desirable modifications, and more attention should be given to regular gymnastic drills, to simple marching and ordered movements. It is, however, important to continue some of the dancing and games at this age, paying more attention to those which require coöperation, and which will help to develop the social instinct.

Through all the grades, as has been suggested, movements should be adapted to the individual as well as to the grade and group, and, so far as is necessary, the individual child should receive particular attention.

2. Hygiene and Health

As all of the subjects of study through the different grades should bear either directly or indirectly on practical living, such bearings should always be present in the consciousness of the teacher. They may or may not be present in the consciousness of the pupil.

Instruction in matters of hygiene and health in the first five or six elementary grades, as previously suggested, should be introduced through other topics in the curriculum, for example, through nature study, geography, domestic science and sometimes through number work. To do this skillfully, the teacher should have a very intelligent instinct and sense in all matters relating to health and practical living, and should readily rec-

ognize opportunities to present hygienic facts through the applications of these other subjects. In fact, much the same tact is required here as in the teaching of morals.

A large number of these applications are included in the curriculum, as, for instance, in the study of occupations in the first grade, where the choice and care of foods, meat and milk, are topics for consideration, and in the second grade, where the care of the animals on the farm at different seasons of the year receives attention. These can be found, however, only by a careful examination of the topics under the various branches of study, there being no reason why they should be brought together in any one place.

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